

Article

Analysis of Change in Students' Visual Acuity

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Abstract: This article analyzes functional changes in visibility and factors affecting it. It was noted that the long-term use of modern information technologies, an increase in visual load, incorrect lighting and a sedentary lifestyle have a negative impact on the system. The study noted that decreased visual acuity is one of the important factors affecting the effectiveness of the educational process. The importance of early detection of changes in visual function, the development of preventive measures and the improvement of hygienic conditions is also justified. The findings have scientific and practical implications in protecting youth health and preventing visual impairment.

Keywords: Vision, Students, Visual System, Functional Changes, Computer, Smartphone, Eye Health.

Introduction

The rapid development of information technology in modern society has a significant impact on almost all spheres of human activity. The widespread use of computers, smartphones and other digital devices, especially among young people and students, dramatically increases the burden on the viewing system. This causes various changes in the functional state of the vision analyzer [1].

Visual acuity is one of the most important physiological indicators of environmental perception. It is closely related to the functioning of the visual system, retina and central nervous system. Therefore, the study of functional changes in vision is one of the pressing problems of ophthalmology and physiology [2].

Scientific studies conducted in recent years show that “the tendency observed in students to reduce visibility is growing”. Often this is due to prolonged visual stress, improper lighting, disruption of rest and a sedentary lifestyle. These factors increase the risk of diseases such as accommodation disorders, eye swelling, and myopia. The World Health Organization reports that more than 800 million people worldwide suffer from myopia [3].

Early detection and analysis of functional changes in perception in students is essential in the development of preventive measures. Therefore, it is necessary to deeply study this problem, evaluate the function of vision using modern diagnostic methods and determine the factors affecting it [4].

The results of this study are expected to have important scientific and practical implications in youth health, prevention of visual impairment and improvement of hygienic conditions in the educational process [5].

Literature Analysis and Methods

In modern scientific research, a global problem is considered to be a decrease in the intensity of student education. The decrease in visual acuity is especially noticeable when working at long distances, intensive use of digital devices, and incorrect lighting [6].

As numerous studies show, myopia is common among students. For example, research by Brian A. Holden has shown that half of the world's population will suffer from myopia by 2050. This indicates that, especially among young people, including students, there is a decrease in "visibility" [7].

In connection with the development of digital technologies, the concept of computer vision syndrome (CVS) has also been widely studied. Long-term use of computers and smartphones can lead to eye fatigue, dryness, and temporary visual acuity loss, according to the American Optometric Association.

In addition, studies by David A. Goss and other scientists have shown that "prolonged remote observation during reading and writing can lead to functional changes and loads on the accommodation system. Aprelev A.E., Setko N.P., Iserkepova A.M., Pashinina R.V. et al. [8].

Some studies show that external factors affect the environment. Lack of natural light, improper living, and poor eye hygiene also have a negative impact on visual acuity. Especially during a pandemic, the expansion of distance education has exacerbated this problem.

Materials and Methods

The study was conducted on the basis of a comprehensive and systematic approach aimed at identifying functional changes in vision in students, studying the factors of their origin and developing scientifically based recommendations. During the study, visometry was used to determine visual acuity. Using this method, the level of vision of students was assessed using special tables and the functional state of the vision analyzer was clarified. In addition, the ability of the eye to adapt to different distances, that is, the accommodation function, was studied [9].

Students 18-25 years old studying in higher educational institutions were selected as the subject of the study. When selecting participants, attention was drawn to criteria such as satisfactory overall health and voluntary consent to participate in the study. At the same time, persons suffering from severe eye diseases, surgical interventions or chronic diseases were excluded from the study. To determine the daily lifestyle and visual load of students, the questionnaire-survey method was used. The questionnaire examined factors such as the duration of gadget use, study and rest regimens, lighting conditions and physical activity levels. This information allowed us to identify the main reasons influencing changes in thinking [10].

The obtained results were processed by mathematical and statistical methods, and arithmetic means, standard deviations and reliability levels were determined. Statistical analysis helped determine the relationship between factors and ensure the validity of the results.

Results and Discussion

The results obtained during the study showed that "the functional state of students significantly depends on lifestyle and visual load".

According to the classic Golovin table, it was found that "visual acuity". The student being checked was at a distance of 5 meters from Golovin's table [11].

To ensure that the results obtained from the Golovin table did not differ from each other, the students were divided into two groups. Pupils whose "visual acuity" is close to critical and their visual acuity plummets. The table 1. shows the results of studying the "visual acuity" of students in both groups [12].

Table 1. Students' vision" Results.

№	Groups to be checked	norm	Blindness results	
			Elasticity of the right eye	Left eye
1.	Group of students whose visibility is close to the criterion, n = 86	1,0	0,96	0,99
2.	Group of students with reduced visibility below criteria, n = 16	1,0	0,33	0,18

As shown by the results carried out using the "Golovin table," in 86 out of 102 students examined, vision is not very different from visual acuity, that is, in the students examined, the average visual acuity is 0.96, and in the left eye - 0.99, or 1.0. There is a sharp decrease in visual acuity in 16 respondents. The visibility of the right eye in this group is 0.33 and the left eye is 0.18. Compared to the first group, this is a very bad result [13].

A 0.9 degree reduction in visibility is not a major change, as it is normally 1.0. As a result of long mental activities or other similar daily activities, "visual acuity" can decrease to 0.9, and after a little rest, return to normal life. When students engage in mental activity over a period of time, visual acuity can drop to 0.9. Especially in cases where the number of homework tasks increases, mental stress increases and mental problems arise. However, this is not a pathological condition. After a short period of time, "visual acuity" returns to its previous level. Therefore, reducing visibility to 0.9 is not a permanent change [14].

However, the sharp changes in the second group are seriously alarming. For example, in 16 subjects, visual impairment to 0.33 in the right and 0.18 in the left eye indicates serious impairment. Such a reduction would be deeply troubling. "

As you know, in cases where "visual acuity is 0.7 and below," it is necessary to wear glasses. In this regard, rates of 0.33 and 0.18 mean that vision "is extremely low and can be considered dangerous boundaries.

As noted above, based on a significant difference in visual acuity levels, students are conditionally divided into two groups: those with near-normative visual acuity and those with significantly decreased visual acuity. When summarizing the results of both groups and obtaining an average score for all participants in the study, it was found that the visual acuity in the right eye was 0.64, and the visual acuity in the left eye was 0.58. The results show that the generalized indicators are also significantly lower than the normative ones.

It turned out that students who have significantly reduced vision intensity make up 15.7 percent of the total number of those examined. This suggests that members of this group "feel the need to wear glasses." In addition, students are likely to have greater difficulty performing tasks related to reading, writing, learning, and intellectual activities in general [15].

Conclusion

Thus, the results of the study showed that "functional changes in perception" in students are multinational in nature, and they need to be studied in an integrated approach. "And recommendations based on the information received serve to prevent visual impairment among young people. As a result of improper training and work, students have "functional changes". By meeting preventive and hygienic requirements in a timely manner, these problems can be prevented or reduced.

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