
**THE NEGATIVE IMPACT OF DIGITAL TECHNOLOGIES ON STUDENTS'
VISUAL ACUITY**

Jaqsimuratova Xurliman Tatlimuratovna¹,

Yusupova Moxira Tulaganovna²,

O'rinboyeva Naima Muzaffar qizi³,

Anormatova Sabina Sobirjon qizi⁴

Assistant¹, Senior Lecturer², Student ^{3,4} Tashkent Medical Academy

mohira.yusupova@tma.uz, naimaurinboyeva1007@gmail.com

Abstract:

97% of young people worldwide use mobile phones, 58% use laptops, 43% use personal computers, and 42% use tablets. Approximately 2.2 billion (28.8%) of the global population suffers from various visual impairments, with a significant portion being students and professionals in digital fields. The quality of life for more than 1 billion people worldwide has declined due to myopia, underscoring the importance of this issue in our lives.

Keywords: Gadget, visual acuity, emmetropia, myopia, astigmatism, Golovin and Sivtsev charts, diopter.

Introduction

Visual acuity is the ability of the eye to see two light points separately. A normal eye is able to see two light points separately at an angle of 1° . Considering this, we aimed to study the negative impact of digital technologies on visual acuity among second-year students. The Golovin and Sinsev table were used to test monocular visual acuity for students.

A table is hung on a well-lit wall, the subject is moved to a distance of 5 meters from the table. One eye is covered with a special barrier, the other eye is tested. The examiner points the letters on the table or Landolt rings with one side open from top to bottom with a pointer, various signs are shown for 2-3 seconds. The lowest line, in which the subject can clearly and without errors, is determined, because it corresponds to the visual acuity indicator [1-3]. This table contains Landolt rings and rows of letters (12 rows in total), the size of which decreases from row to row in the direction from top to bottom. The distance is indicated on the left side of each row D (in meters), from which a person with normal vision should see them (50.0 meters for the top row; 2.5 meters for the bottom row). On the right side of each row is the value V (in conventional units) - the visual acuity when reading the characters from a distance of 5 meters has a value (0.1 if the eye sees only the top row; 2.0 if the bottom row is visible).

Normal vision (1.0) is when a person sees the tenth line with each eye from a distance of 5 meters, as shown in the table - in a naturally lit room (illumination should not be less than 10 lux) or illuminated by an additional electric lamp. Then, visual acuity is calculated based on this formula:



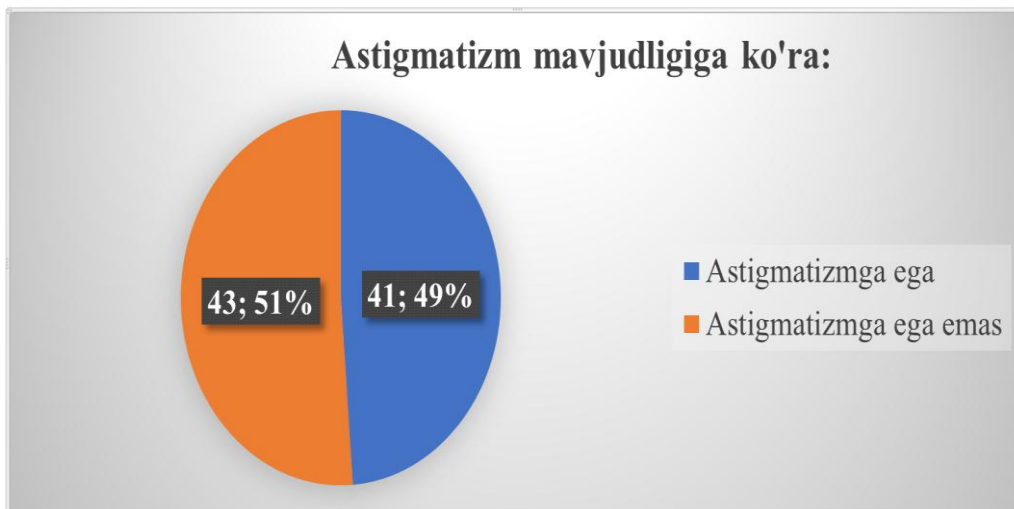
$$V = -\frac{a}{D};$$

Here V is visual acuity, a is the distance between the subject and the table, and D is the distance at which a normal eye should clearly see the letters in this row. The second eye is also tested in this way [1-4].

The causes of visual impairment among students were studied using the questionnaire method. Respondents were asked about the causes of vision impairment and when it began.

The experiment was conducted in 6 groups of second-year students, with a total of 84 students (42 boys, 42 girls) aged 18-27. The results were statistically analyzed and the average visual acuity was found.

During the examination, students were divided into two groups according to visual acuity: a group of students with astigmatism and a group of students without astigmatism. (Diagram 1).



Students without astigmatism - 43, of which 24 were girls, 19 were boys, and those with astigmatism - 41, of which 23 were boys, 18 were girls.

Of those without astigmatism, 2 boys and 1 girl had 0.1 lines, 1 girl had 0.2 lines, 1 boy and girl had 0.4 lines, 1 boy had 0.5 lines, 1 boy and girl had 0.6 lines, and one boy had 0.8 lines, while 8 girls and 3 boys had full vision (emmetropia, normal vision) (1 line), making a total of 16 students with 1.5 lines, of which 6 were boys and 10 were girls. Among all the students, 6 students had hawk eyes (2 lines). Of these, 2 were girls and 4 were boys. Of the total number of students surveyed, the prevalence of hawkishness among girls is lower than that among boys, at 7% (Diagram 2).



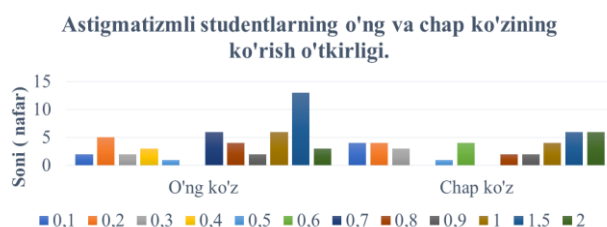
The average vision of students with the same visual acuity was 1.33. Of these, the average among boys was 1.125, and among girls - 1.1.

Astigmatism (from the Greek "a" - absence and "stigma" - point) is a refractive error (ametropia) that occurs when parallel light rays entering the eye are not focused on the retina. As scientists have found, most young people have 1-2 diopters of direct astigmatism immediately after birth. After the first year of life, it decreases in most children to 0.5-0.75 diopters and remains so until the end of life. It is called physiological and practically does not affect vision and is present in 90% of the population. And only in 10-15% of cases does astigmatism exceed 1 diopter. Among students with astigmatism, the visual acuity of the right eye was on average 0.9 ± 0.06 , and that of the left eye was on average 0.9 ± 0.03 . Diagram 3 compares the visual acuity of the right and left students with astigmatism.

In some people, astigmatism is accompanied by myopia. This is called myopic astigmatism in medicine. Myopic astigmatism has symptoms similar to myopia: in both cases, the image is formed in front of the retina.

However, in astigmatism, the shape of the cornea is distorted, while in myopia, the size and configuration of the eyeball are distorted.

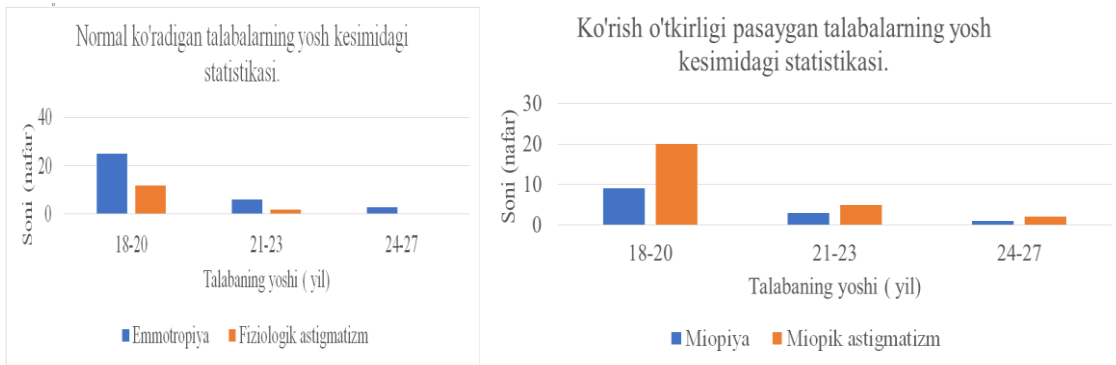
Astigmatizm turi	O'g'il bolalar orasida	Qiz bolalar orasida
Fiziologik astigmatizm	15 ta	1 ta
Patologik astigmatizm	9 ta	16 ta



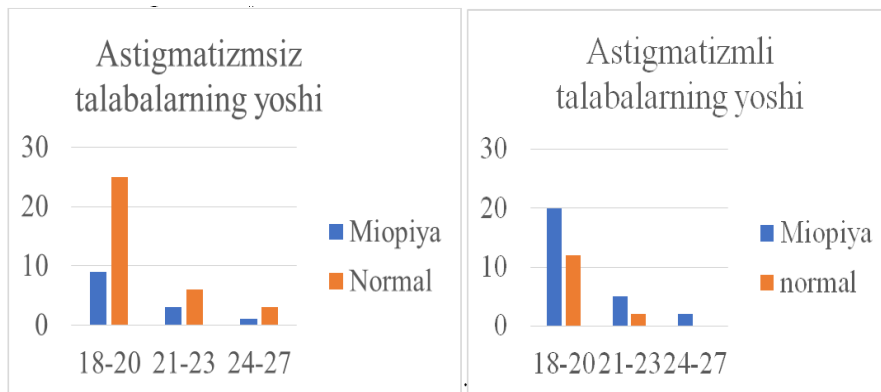
The table presents statistics on physiological and pathological astigmatism: Among students with different visual acuity, it is noticeable that there are a large number of combinations of their visual acuity. However, when they were analyzed, it turned out

that in most students with different focal lengths, the right eye sees better than the left eye.

The statistics of the respondents by age are presented in the diagram below.



The chart below shows that myopic astigmatism is more common than myopia among students.

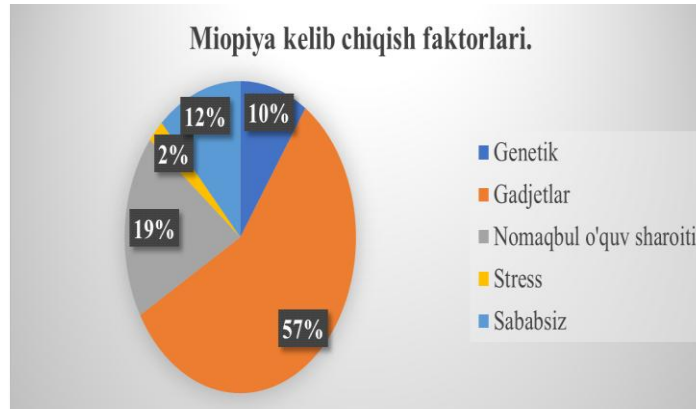


Among the general examined students, the average acuity of the right eye of girls was 0.5 ± 0.06 , the left eye acuity was 0.5 ± 0.06 , and among boys, the average acuity of the right eye was 0.7 ± 0.05 and the left eye was 0.7 ± 0.075 .

As we noted above, the prevalence of hawk-eyed children among boys, and the fact that boys have better eyesight than girls when comparing visual acuity between girls and boys, also indicate the effect of physical activity on visual acuity.

Gadgets are a way to master everyday life. Often, uncontrolled use of digital devices leads to posture disorders, decreased visual acuity, headaches, increased arterial blood pressure, inability to concentrate, psychoemotional stress, and mobile addiction. Despite high-quality protective coatings, working at a computer reduces visual acuity, eye mobility; disrupts refraction and accommodation, binocular vision, and color perception. The survey revealed that in 10% of all students suffering from myopia, the factor causing the disease was genetic, in 19% - physical (unfavorable learning conditions: in a poorly lit room, in transport, reading while lying down), in 57% - various

gadgets, and in 2% - stress. Also, the remaining 12% of students note that they do not know the cause of their vision loss.



Without taking into account the genetic factor, most of the respondents reported a decrease in visual acuity in the past 5 years. Respondents who use smartphones for more than 3 hours a day are more likely to have visual impairment and develop the following diseases: amblyopia, myopia, astigmatism, computer vision syndrome and hyperopia.

Conclusion: Based on the results, we can note the following:

1. Among students, 49% have astigmatism, but among them there are students with physiological astigmatism. Visual impairment is more common among girls than boys. In terms of causes, the main factor is information and communication gadgets.
2. According to the experiment conducted among students at the Crimean Medical Institute, their level and nature of the disease, nutritional characteristics, lifestyle were assessed. More respiratory diseases, diseases of the nervous system and sensory organs were observed. The eyes are also negatively affected by electromagnetic waves emitted by gadgets, as well as ultraviolet rays. When working with electronic devices, students blink 3 times less than when working with paper sources of information. Therefore, the surface of the eye dries out and itching may occur[4]. Therefore, it is recommended that students reproduce educational literature in book form and perform regular eye exercises.
3. A decrease in visual acuity has also been observed among people who are addicted to various video games. In this case, not only ultraviolet rays emitted by the eyes during prolonged use of the computer, but also stress caused by an increase in the amount of cortisol in the blood due to strong arousal during the game, have their effect. Psychogenic visual impairment includes a narrowing of the visual field. A characteristic feature of the disorder is that the patient complains of impaired vision, he does not see surrounding objects, but at the same time spatial orientation is preserved.
4. To preserve the vision of the human eye, each person, taking into account his age and health, should lead a healthy lifestyle, choose an active lifestyle and eat right, rest on time, avoid stress, and undergo regular medical examinations. It is advisable to walk more in the fresh air, do physical education, and do light work.

References:

1. Т.Н. Захаркина, И.А. Исакова. Гаджетизация: эффекты влияния на общественные процессы // Вестник Нижегородского университета им. Н.И. Лобачевского. Серия: Социальные науки, 2019, № 3 (55), с. 115–121.
2. С.Г. Яценко, С.Ю. Рыбалко, О.А. Пилунская, С.Э. Шибанов Гигиеническая оценка влияния электромагнитных факторов коммуникационных устройств на состояние здоровья студентов. // Гигиена и санитария. 2017; 96(10), 1001-1003. DOI: <http://dx.doi.org/10.18821/0016-9900-2017-96-10-1001-1003>
3. Д.А. Васильевич, Б.Н. Иванович. Ухудшение зрения у студентов высших образовательных учреждений // Международный журнал прикладных наук и технологий «Integral» №5 2020; С. 56-60. DOI 10.24411/2658-3569-2020-10095.
4. Elmurotova D.B., Nishonova N.R., Kulueva F.G., Uzoqova G.S., Xo'jamberdiyeva J.N., Jo'rayeva Sh.A. Mashaits: islamic interpretation of the greek philosophical heritage // South Eastern European Journal of Public Health (SEEJPH), (ISSN: 2197-5248) V.XXV, S2, 2024, Posted:05-12-2024, P.516-522, <https://www.seejph.com/index.php/seejph>
5. Shodiev A.A., Mussaeva M.A., Nishonova N.R., Elmurotova D.B., Islamova D.X. Improving Structure and Superconductivity of Coated Cuprate Tapes by Irradiation with Electrons and Gamma-Rays // Nanotechnology Perceptions, ISSN 1660-6795, V.20, N.7 (2024), P. 209-126, <https://nanontp.com/index.php/nano/article/view/3822>
6. М.И. Базарбаев., Д.Б. Элмуротова., Ш.К. Нематов., Ш.Ш. Азимов., Т.З. Даминов., А.Р. Махкамов. Современные подходы к гигиене рук медицинского персонала //The journal of humanities & natural sciences, Issue 8, V.1, 2024. P.208-217.
7. Elmurotova D.B., Odilova N.J., Jumanov Sh.E. Semmelweis against puberner fever in hungary // Western European Journal of Linguistics and Education, V.2, Iss1, January-2024 ISSN (E): 2942-190X, P.56-59, Germany. <https://westerneuropeanstudies.com/index.php/2/article/view/255>
8. Элмуротова Д.Б., Элмуратов Э.Б. Исследование и совершенствование техники и технологии по освоению скважин в сложных горно-геологических условиях на месторождениях Республики Узбекистан // Лучшие интеллектуальные исследования, Ч-13, Т.5, Январь-2024, С.11-23, Россия. <http://web-journal.ru/index.php/journal/issue/view/89>
9. Elmurotova D.B., Sayfullayeva D.I., Isroilova Sh.A. Terms of medical information system, World Bulletin of Public Health (WBPH), V.34, May, P.91-92, 2024 ISSN: 2749-3644, Berlin. <https://www.scholarexpress.net>
10. Elmurotova D.B, Majlimov F.B., Zuparov I.B., Kayumova K.S., Xudoyberdiyev B.A. A modern approach to hand hygiene in medicine // European Journal of Humanities and Educational Advancements (EJHEA), V.5 N.05, May 2024 ISSN: 2660-5589, P.51-53, Spain. <https://www.scholarzest.com>

11. Elmurotova D., Arzikulov F., Egamov S., Isroilov U. Organization of direct memory access // Intent Research Scientific Journal-(IRSJ), ISSN (E): 2980-4612, V.3, Is.10, October – 2024, P. 31-38., Philippines, <https://intentresearch.org/index.php/irsj/article/view/345>
12. Elmurotova D., Arzikulov F., Izzatullayev I., Olimov A., Abdurahmonov J. The role of remote diagnostics in medicine // World Bulletin of Public Health (WBPH), V.39, October 2024, ISSN:2749-3644, P.102-105. Germany, <https://scholarexpress.net/index.php/wbph/article/view/4664>
13. Elmurotova D., Fayziyeva N.A., Urmanbekova D.S., Bozorov E.H. Implementation of the method of teaching x-ray therapy in higher educational institutions // Web of Teachers: Inderscience Research, V.2, Issue 10, October-2024, ISSN (E):2938-379X, P.18-23. Spain. <https://webofjournals.com/index.php/1/article/view/1868>
14. Elmurotova D.B., Esanov Sh.Sh., Abduraxmonov S.A., Ulug'berdiyev A.Sh., Umarov J.S. Medical device reliability and measuring instrument specifications // Eurasian Journal of Engineering and Technology, EJET, V.34, October-7, 2024, ISSN: (E) 2795-7640, P.10-13, Belgium. <https://geniusjournals.org/index.php/ejet>
15. Shodiev A.A., Mussaeva M.A., Elmurotova D.B. Magnetic resistance and mobility of carriers of HTSC – YBCO tapes irradiated with 5 MeV electrons // Eurasian Journal of Physics, Chemistry and Mathematics, EJPCM, V.35, October-26, 2024, ISSN: 2795-7667, P.25-33, Belgium. <https://geniusjournals.org/index.php/ejpcm/article/view/6393>
16. Elmurotova D.B., Fayziyeva N.A., Odilova N.J. Properties of electron and neutron therapy // Web of Medicine: Journal of medicine, practice and nursing, V.2, Issue 10, October-2024, ISSN (E): 2938-3765, P.137-141, Spain.
17. Elmurotova D.B., Yoqubboyeva E.Z., Orifqulova M.F., Imanova L.N. Application of computer technologies in medicine // Western European Journal of Medicine and Medical Science, V.2, Issue 11, ISSN (E): 2942-1918, November-2024, P.1-12. Germany. <https://westerneuropeanstudies.com/index.php/3>.