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Myopia and Its Specific Characteristics of Its Distribution Among School Students

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Abstract In this study, a comprehensive analysis was conducted to study the prevalence of myopia among schoolchildren in Andijan region. Visual acuity among schoolchildren is estimated using D.A. Sivtsev's table. This method is a convenient method among all students of school age. During the study, using autorefractometry, this device helps determine the radius, curvature, corneal refraction and refractive properties. The obtained results showed that 212 of the 2304 schoolchildren of Andijan region were diagnosed with myopia by the method of applicants, which is 9.20%, of which 4.47% were boys and 4.73% were girls. Higher age groups (18 years) showed higher rates of myopia. As a result of the medical examinations carried out among the students of the school involved in the study, myopia was detected in 521 (22.61%) of them, of which 254 (10.93%) were boys and 267 (11.58%) were girls. 713 (30.94%) of the students were examined, 15.06% were boys and 366 (15.88%) were girls. The obtained data also confirm that conditions within the school, eating habits of students and activities in the health system affect the development of myopia. Medical examinations carried out in schools show that there is a correlation between student nutrition and school conditions. All this indicates the need to develop measures to prevent and combat myopia. Thus, this study is important for the study of the prevalence of myopia among schoolchildren in Andijan region, and it shows that the role of social environment and conditions inside the school is important in maintaining and developing the health of students. Development and implementation of programs for the prevention of myopia, as well as research in the direction of developing a healthy lifestyle of students should continue.

Keywords Myopia, Schoolchildren, Health status, Visual acuity

1. Introduction

Myopia is the most common cause of deterioration of distance vision. When myopia worsens, it causes the development of retinal complications, blurred vision, reduced corrected visual acuity, and in severe cases leads to disability in working-age youth.

According to the World Health Organization. In developed countries, the number of people suffering from myopia varies from 10% to 90%. In Russia, 10% of the population is short sighted, while in the USA and Europe such patients are 25%, and in Asian countries 80% [1].

WHO has selected low (blurred) vision in uncorrected refractive errors as one of the leading areas for eliminating preventable blindness by 2020. Uncorrected myopia causes difficulty in vision, reduces professional flexibility and worsens the quality of life [2].

Myopia occurs in people of all races and ethnicities, but certain ethnicities have been identified.

The worldwide frequency of myopia ranges from 2% in Australian aborigines [3] to 93–95% among university students in Hong Kong and Taiwan [4]. Myopia occurs in one in three adults in Europe and the United States, and in one in six adults in Australia. The prevalence of myopia among adolescents also varies considerably among different populations. Differences in the prevalence of myopia in children with different etiologies were found among high school students [5]. In Germany, myopia was found in 5.5% of children aged 7–11 years, and 21% among adolescents aged 12–17 years. In China, 55% of girls and 38% of boys suffer from myopia before the age of 16 [6].

The impact of school health media on children's short-sightedness and informing parents about it through social networks was shown in the works of Chinese scientists [7-8].

Taking into account the above, preventing the spread of myopia is one of the urgent problems facing the workers of the field.

The purpose of the study is to analyze the prevalence of myopia at different levels among school-age students in Andijan region.

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2. Research Materials and Methods

Research work was carried out among schoolchildren who were living and studying in all cities and districts of Andijan region.

During the selection of schools, in-depth medical examinations were carried out in order to assess the visual acuity of the population living in the urban and rural areas of the region, the densely populated districts and students studying in schools, and an ophthalmologist was also involved along with other specialists. The data of the identified students were also obtained from the applicants for the study.

Visual acuity is performed by visometry, and this method is the standard test for assessing eye acuity. This method is performed with the help of a special eyeglass device and a table consisting of special interchangeable lenses.

Visual acuity is evaluated using D.A. Sivtsev's table [9]. This method is familiar to all students of school age.

During the study, using autorefractometry, this device helps determine the radius, curvature, corneal refraction and refractive properties.

This method is considered important for children's ophthalmology, it takes less time and has high accuracy.

In determining the disease and evaluating the obtained results, visual acuity was diagnosed with a diopter, and low, moderate and severe levels of myopia were evaluated.

The medical examination was carried out with the participation of a school pediatrician, an ophthalmologist, and an ophthalmologist who formed the group that planned the research work.

Statistics for Windows 7.0 personal computer application package was used for statistical processing of research results.

3. Analysis of the Obtained Results

School students' health status, not only their physical development, their ability to work, mastering of complex subjects at school, physical education and technology has a drastic effect.

Visual activity affects not only their physical ability, but also their dynamic and statistical fatigue, social environment, mental health of students, together with their management of all activities.

Today, among children and adolescents, the place of diseases of the visual system is high in the state of mental health and its deterioration.

Myopia among schoolchildren is associated with internal school factors, including school equipment and their location, changes in environmental factors, the condition of school rooms and their color, condition, performed medical examinations and their effectiveness in organization, the state of lighting in the school, the level of medical and artificial lighting., the position and arrangement of lights, the mismatch of equipment to the height of schoolchildren, the failure to take into account height and health status, the suitability and supply of animal and vegetable proteins in the daily diet of schoolchildren, and the lack of vitamin A consumed during the day depend on such factors.

Schools located in the cities and districts of Andijan region under control, their number and the absolute number and ratio of registered studies in % are presented in Table 1.

Table 1. Number of students studying in schools in Andijan region, abs.

No	Andijan region cities and districts	m/s	Number of school students				
			total	boys		girls	
				a bs.	%	a bs.	%
1.	Andizhon city	74	87 665	47340	54.0	40325	46.0
2.	Xanabad city	8	7 088	3512	49.5	3576	50.5
3.	Oltinkol district	56	37 643	23366	62.0	14277	38.0
4.	Andizhon district	58	46 133	23611	51.1	22522	48.9
5.	Asaka district	70	61 215	31123	50.8	30092	49.2
6.	BalIqchi district	62	37 622	18857	50.1	18765	49.9
7.	Boston district	28	13 706	7025	51.2	6681	48.8
8.	BOlokboshi district	35	25,777	13173	51.1	12604	48.9
9.	Joloquduk district	55	32 937	16752	50.8	16185	49.2
10.	IzbOscan district	56	45 209	23501	51.9	21708	48.1
11.	Korgontepa district	63	37 838	19524	51.9	18314	48.1
12.	Markhamat district	47	31 588	16545	52.4	15043	47.6
13.	PakhtaAbad district	51	37 376	18853	50.4	18523	49.6
14.	UluGnor district	27	11 238	5523	49.1	5715	50.9
15.	XOjaabad district	39	22 282	10826	48.6	11456	51.4
16.	Shahrikhon district	77	60 546	29521	48.7	30025	51.3
	By province	806	595863	309052	51.8	286811	48.2

Table 2. Incidence rate according to appeals in Andijan region

Age group	Verified students	Myopia was diagnosed					
		boys		girls		Total	
		a bs.	%	a bs.	%	a bs.	%
7	178	3	1.68	4	2.24	7	3.93
8	203	5	2.46	4	1.97	9	4.43
9	196	5	2.55	4	2.04	9	4.59
10	205	6	2.92	7	3.41	13	6.34
11	217	7	3.22	7	3.22	14	6.45
12	186	5	2.68	6	3.22	11	5.91
13	173	9	5.20	8	4.62	17	9.82
14	187	12	6.41	9	4.81	21	11.22
15	194	10	5.15	12	6.18	22	11.34
16	198	11	5.55	12	6.06	22	11.11
17	179	9	5.02	13	7.26	22	12.29
18	188	11	5.85	13	6.93	24	12.76
total	2304	103	4.47	109	4.73	212	9.20

According to the data presented in Table 1, according to the statistics of the academic year 2022-2023, the total number of schools in the Andijan region of the Fergana Valley is 806, and according to the statistics organizations, it is 220 less than the schools in the Fergana region, and 64 more than the Namangan region.

Andijan province, the number of schools in Shahrikhan district is 77, and the number of students in them is 609,052, while the number of students in 27 schools in Ulughnor district is the lowest, and the number of students in 27 schools is 11,238. is considered.

The number of cities in the regions of the Fergana valley is more than 4 in Fergana region, Andijan and Khanabad are 2 in Andijan region, there are 81 schools in both towns, 74 in Andijan and 8 in Khanabad, and 14.71% of the total students are educated in Andijan. they get.

Khanabad town has the least number of residents and schoolchildren in the province. The lowest indicator of the number of schools is located in the town of Khanabad, and in the districts it is located in Boston and Ulug'nor districts.

In our study, we are not interested in the number of schools, but in the number of students and the incidence rate. As a result of this, we will be able to determine the prevalence of diseases by age and gender, as well as the basis for making a plan for diagnosis, treatment, and elimination. During our research, the analysis of the return of schools and the number of students in them shows that in the analysis of the detection and spread of the disease, the determination of the general students and their age and gender gradation of the disease and the exact distribution status, in the section of schools, age and classes, and help to assess the influence of risk factors gives The number of students in the 2022-2023 academic year is 595,863, which is 94,450 less than the number of students in Fergana region and 68,359 more than the number of students in Namangan region. In terms of population density, Andijan region takes the first place in our country, and as of January 2024, it is 3394.4 thousand people, and in terms of the number of schools and population, it is the highest in Fergana region in the territory of Fergana valley. The return of the number of students and the number of schools under control, the spread of the disease among the general students and its epidemiological analysis are important. One of the main tasks of modern epidemiology today is the distribution of non-communicable diseases, their state throughout the year, depending on the season, distribution among young people and its dependence on territories. Geographical features of cities and villages are also important in the spread of diseases. In our next task during the study, we analyzed referrals, medical examinations, and net incidence rates in a controlled incidence analysis.

Table 2 shows the general results of myopia among schoolchildren in the Andijan region.

We found in the analysis of the data obtained in Table 2 that the influence of intra-school factors in schools showed its effect in the cross-section of years. Among the school factors, medical examinations, lighting and nutrition of schoolchildren are among the main factors.

The results of the questionnaire conducted among students showed that the majority of them eat fas-fut and eat confectionery products, which causes an increase in the disease in the youth.

The incidence of complaints was 9.20% among the students under control, 103 (4.47%) among boys and 4.73% among girls. The highest rate in the age group was 12.76% among 18-year-olds. The incidence is mainly 0.26% higher in girls than in boys, which is not significantly different.

It was found that the incidence rate of referrals was 212 (9.20%) cases.

At the next stage of the research, we analyzed the incidence of disease detected during medical examinations among schoolchildren, and the results are summarized in Table 3.

Table 3. Age and gender distribution of medically examined schoolchildren in Andijan region

Age group	Verified students	Myopia was diagnosed					
		boys		girls		total	
		a bs.	%	a bs.	%	a bs.	%
7	178	16	8,98	18	10.11	34	19.10
8	203	21	10,34	18	8,86	3 9	19,21
9	196	22	11.22	21	10,71	43	21,93
10	205	23	11,2 1	22	10, 72	45	21,95
11	217	24	11,05	23	10,59	47	21,65
12	186	20	10,75	23	12.36	43	23.11
13	173	19	10.98	21	12,13	40	23.12
14	187	21	11,22	23	12.29	44	23.52
15	194	22	11.34	24	12.37	46	23,71
16	198	22	11,11	25	12,62	47	23,73
17	179	21	11.73	24	13.40	45	25,13
18	188	23	12,23	25	13.29	48	25.53
total	2304	254	10.93	267	11.58	521	22.61

Table 4. Specific disease rate of schoolchildren in Andijan region

Age group	Verified students	Myopia was diagnosed					
		boys		girls		total	
		a bs.	%	a bs.	%	a bs.	%
7	178	19	10.67	22	12.29	41	22.90
8	203	26	12.80	22	10.83	48	23.64
9	196	27	13.77	25	12.75	52	26.53
10	205	29	14.14	29	14.14	58	28.29
11	217	31	14.28	30	13.82	61	28.11
12	186	25	13.44	29	15.59	54	29.03
13	173	28	16.18	29	16.76	57	32.94
14	187	33	17.64	32	17.11	65	34.75
15	194	32	16.49	36	18.55	68	35.05
16	198	33	16.66	37	18.68	70	35.35
17	179	30	16.75	37	20.67	67	37.43
18	188	34	18.08	38	20.21	72	38.29
total	2304	347	15.06	366	15.88	713	30.94

As can be seen from the results presented in Table 3, the condition detected during the medical examinations showed sharply different results from the diseases detected by the appeals.

Myopia was detected in 34 out of 178 students of the 1st grade involved in the study, and their proportion was 19.10%, 16 (8.98%) in boys and 18 (10.11%) in girls.

Among 10-year-olds in Andijan region, 45 (21.95%) of 205 students were diagnosed with the disease, and the prevalence rate among boys and girls was 23 (11.21%) in boys and 22 (10.72%) in girls at this age. organized.

In the growth and development patterns of children after 11 years, despite the return of a wavy state among 12-15-year-olds, the overall morbidity rate was 23.13% among 13-year-olds, and 23.71% among 15-year-olds. As the age increases, the incidence rate also increases.

A sharp increase in the level of morbidity among schoolchildren aged 18 was found.

Table 4 shows the results of the specific incidence rate of schoolchildren in Andijan region.

As it can be seen from the results of the analysis, the prevalence of myopia, as well as a gradual increase in the age groups, was observed, and this result mainly started at the age of 12 years, and was repeated at a higher level in 17-18-year-olds than in 13-year-olds.

The analysis of the actual incidence rate among the school children under control shows that the prevalence of the disease increased year by year in the age group, for example, it was

23.03% among 7-year-olds and 25.80% among 11-year-olds., the incidence rate increased with age.

Among 18-year-olds, 72 cases accounted for 38.28%, which shows a 15.39% increase in hashtags over 10 years and an increase of 1.53% over the years.

It can be seen that from the beginning of school education, the transition of students to disordered eating, disordered exercises at school, placement without taking into account the complexity of lessons, insufficient level of lighting and other factors are the reasons.

The prevalence of myopia among 17-18-year-old schoolchildren was higher than that of other young people, it was 37.48% among 17-year-olds and 38.29% among 18-year-olds. the factors that influenced the formation of secondary gonads and the fact that adolescents of this age have full use of information communication technologies and mobile phones and their use period is more than 4-6 hours a day, they only use mobile phones in scheduled activities and extra classes at school, not only their visual acuity and activity, perhaps their negative impact on the nervous system was also found during medical examinations.

To prevent these conditions and to prevent the early decline of visual acuity, a healthy lifestyle and physical minutes aimed at preventing eye fatigue, healthy nutrition, improving school factors, periodic medical examinations and monitoring their effectiveness, and identifying factors related to the development of myopia and it is necessary to control it.

4. Conclusions

1. According to the statistics of the 2022-2023 academic year, the number of public schools in Andijan region of the Fergana Valley is 806, and the total number of students is 595,863. Among the total 595,863 school students, 713 (30.94%) of the 2,304 examined in the region were diagnosed with myopia. 347 (15.06%) of them were boys and 366 (15.88%) were girls.
2. Analyzing the complaints among schoolchildren, myopia was detected in 212 (9.20%) of the 2304 examined, of which 103 (4.47%) of boys and 109 (4.73%) of girls were diagnosed with various degrees of myopia.
3. As a result of the medical examinations conducted among schoolchildren involved in the research, myopia was detected in 521 (22.61%) of the 2304 examined, of which 254 (10.93%) boys and 267 (11.58%) girls had myopia. It was found that it was 19.10% among 7-year-olds, 23.11% among 12-year-olds, and 25.53% among 18-year-olds. It was found that there was no sharp difference between boys and girls.
4. According to the exact incidence rate among school students, 713 (30.94%) of the total examined were diagnosed with myopia, 15.06% among boys and 366 (15.88%) among girls, and preventive examinations should be carried out in this regard. and requires determining the causes.

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