

Prevalence of Refractive Errors in Farzanegan High School for Girls in Kermanshah in 2019

Mohammad Javad Veisimiankali* and Milad Veisimiankali

¹Department of Medicine, Islamic Azad University, Tehran, Iran

²Department of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran

Corresponding Author*

Mohammad Javad Veisimiankali
Department of Medicine,
Islamic Azad University,
Tehran, Iran,
E-mail: javadvissy@gmail.com

Copyright: © 2023 Veisimiankali MJ, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: January 22, 2023, Manuscript No. JBTW-23-87668;
Editor assigned: January 24, 2023, PreQC No. JBTW-23-87668 (PQ); **Reviewed:** February 07, 2023, QC No. JBTW-23-87668;
Revised: April 18, 2023, Manuscript No. JBTW-23-87668 (R);
Published: April 26 2023, DOI: 10.35248/2322-3308.23.12.3.011

Abstract

Background: The problem of refractive errors is one of the most common issues in ophthalmology and the diagnosis and treatment of refractive errors in students is of great importance. Considering the importance of timely detection of refractive errors as an anomaly in students and also the lack of comprehensive information in this field and the lack of a similar study in the city of Kermanshah, it was done in 2019.

Methods: In this cross sectional study done in 2019. The subjects were selected by available sampling method. Using frequency tables, *chi-square* test in agreement tables, and Pearson correlation coefficient test was performed. For data analysis, SPSS 21 statistical software and a significant level of 0.05 were considered.

Results: Among 296 high school students in Farzanegan high school in Kermanshah, more than half had refractive errors in at least one case. Most refractive errors included myopia, which was associated with aging in this period. Also, the prevalence of stigmatism in this period was about 14%, which was reported more than in other studies. Also, most of the association with stigmatism was myopia in individuals. Also, no relationship was found between students rates and refractive errors ($P > 0.05$).

Conclusion: Due to the high prevalence of myopia associated with astigmatism, it seems that screening programs to identify, follow up and treat refractive errors in students in Kermanshah and the country, in general, is of particular importance and should be done regularly. And be scheduled.

Keywords: Refractive errors • Students • Kermanshah • Secondary school • Myopia

Introduction

The power of vision is very important in the quality of life, so that its effect on other components of health, such as motor activities, is obvious, and the reduction of physical activities also causes a decrease in the quality of life [1]. People with visual impairment may be more at risk of injury such as pedestrian accidents due to diagnostic abnormalities in visual perception of the environment [2].

Refractive errors are the fourth cause of blindness in the world and in many parts of the world, after cataracts, they are the second cause of treatable blindness and one of the most common causes of visual impairment [3]. Drawing the rays entering the eye that lead to vision has shown that the optical system of the eye is a system consisting of three lenses for refracting light. The light is broken in the layer of the aqueous humour, lens and vitreous, and finally, by radiation on the retina, it leads to the creation of a visible image. The cornea does not play a role in refracting light and its only role is to create curvature in the anterior surface of the aqueous humour if the object is placed at different distances, the diameter of the lens changes, and in this way, it leads to the placement of the image of the object on the retina, which is called adaptation. Due to problems that may occur in the structure of the eye, it is possible that the created image of the object is not clearly formed on the retina. In general, refractive errors are divided into three categories: Myopia, hyperopia, and astigmatism [4]. The studies conducted in Iran on the prevalence of refractive errors showed that the rate of this problem in the students of Dezfoul and Shiraz cities was 3.4% and 4.35% for myopia, respectively, and 6.6 for hyperopia. 16% and 5.04% and astigmatism is 18.7% and 11.27% [5,6]. Also, in another study, the prevalence of myopia, farsightedness and astigmatism in children ready to enter Shahrood school was reported as 1.7%, 20.5% and 19.6%, respectively [7]. Considering the complications caused by refractive disorders as well as the importance of its correction in increasing the quality of life, especially among students, we decided to investigate the prevalence of refractive errors among students of Farzanegan girls high school in Kermanshah in 2019.

Materials and Methods

This study is descriptive cross sectional. The study population is students of the second year of Farzanegan High School in Kermanshah. The study subjects were selected by convenient sampling method, based on previous studies, the sample size in this study was 266 people [8]. This study was approved by the ethics ID IR.KUMS.REC.1398.181 at Kermanshah university of medical sciences [9].

After obtaining consent, information related to individual characteristics, history of ophthalmological examinations, history of systemic diseases, drugs used and contraindications of cycloplegic refraction (history of seizures, history of nervous system diseases and history of congenital heart diseases) for students to be registered and if they meet the entry criteria clinical examinations including non-cycloplegic auto refraction and cycloplegic refraction and visual acuity were performed [10-13]. First, if the student had glasses, the power of the glasses was read by a hand held tensiometer and recorded in the file. Finally, necessary actions and follow-ups were done for students who need treatment, and if pathological cases were observed, they were referred to an ophthalmologist. In this study, the prevalence of refractive errors and other variables were reported as percentages. The results were analysed using frequency tables, *chi-square* test in consensus tables, and Pearson's correlation coefficient test. For data analysis, statistical software spss 21 and significance level of 0.05 was considered [14].

Results

The average age of students in this study was 16 ± 1.3 . In terms of the prevalence of myopia, the results of which are shown in (Table 1), The prevalence of myopia in the age group of 15 years-16 years is equal to 25.49%, in the age group of 16 years-17 years it is equal to 30.3% and in the age group of 17 years-18 years it is equal to 35.4% Also, the results of statistical analysis show an increase in the prevalence of myopia with increasing age, which is statistically significant ($P < 0.001$) [15].

Table 1. Distribution of the frequency of myopia in the student's test of the second year high school for girls in Farzangan city of Kermanshah in 2019 according to age.

Percent	Number of students myopia	Sample size	Educational level (age)
25/49	26	102	(15-16) 10 th
30/3	30	99	(16-17) 11 th
35/78	34	95	(17-18) 12 th
30/4	90	296	Total

The results of Table 2 show that the prevalence of myopia in the age group of 15 years-16 years is 24.50%, in the age group of 16 years-17 years it is 22.2% and in the age group of 17 years-18 years it is 26% [16].

Table 2. Prevalence distribution of hyperopia in students of Farzangan girls high school of the second term of Kermanshah city in 2019 according to age.

Percent	Number of students myopia	Sample size	Educational level (age)
24/50	25	102	(15-16) 10 th
22/2	22	99	(16-17) 11 th
25/26	24	95	(17-18) 12 th
23.98	71	296	Total

The results of Table 3 show that the prevalence of astigmatism in the age group of 15 years-16 years is equal to 14.70%, and 10 people have myopia and 3 people have hyperopia at the same time. In the age group of 16 years-17 years, the prevalence of astigmatism is 10.10%, of which 5 people have myopia and 1 person has hyperopia [18]. The prevalence of astigmatism in the age group of 17-18 years is equal to 18.94% of these, 12 people are

it is 25% statistical analysis does not show a relationship between increasing age and increasing the prevalence of myopia in the study participants [17].

simultaneously suffering from myopia and 5 people are suffering from hyperopia [19]. In general, the prevalence of astigmatism was reported as 14.52%. Statistical analysis does not show a relationship between increasing age and increasing prevalence of myopia in study participants ($p>0.05$) [20].

Table 3. Distribution of the frequency of astigmatism and its accompanying refractive errors in students of the second year of Farzangan high school for girls in Karanshah city in 2018 according to age.

Percent	Concomitant hyperopia	Concomitant myopia	The number of astigmatism students	Sample size	Educational level (age)
14/70	3	10	15	102	(15-16) 10 th
10/10	1	5	10	99	(16-17) 11 th
18/94	5	12	18	95	(17) 12 th
14/52	9	27	43	296	Total

Discussion

Refractive defects are one of the most important visual defects in the age group of 14 to 18, which requires special attention in this age range. In this study, more than half of the studied population had a vision defect. The prevalence of refractive defects is different in different countries. Factors such as heredity, race, etc. It affects the prevalence of refractive errors. In this study, there was a high correlation between the refractive error of the right and left eyes of the patients, and the study of other researchers also confirms this correlation. Many studies have been conducted on the effect of age and gender on the prevalence of refractive errors. The results of these studies show that the prevalence of refractive errors is not the same in different ages. Therefore, in children before entering school, the prevalence of binocular refractive error is higher than that of myopia. It decreases at this age. After the age of 74, due to the changes in the nucleus of the eye lens, the refractive error of myopia may increase. Researcher's studies show that the prevalence of astigmatism is not the same in different ages. The

results of our research show that out of 296 second year students of Farzangan middle school in Kermanshah who visited the optometry clinic of Kermanshah university of medical sciences in 2018, the prevalence of refractive errors was more than half of the study population, so the results showed that with increasing age, nearly The myopia increases in our studied girls. In some studies, the prevalence of myopia in girls was reported more, which can indicate the relationship between gender and racial and environmental factors effective in causing myopia. Our findings about myopia were consistent with other studies in Iran. Also, the prevalence of refractive error was lower than in other countries, including China and Singapore. The prevalence of hyperopia in our study was 23.98%, and the prevalence of hyperopia the studied population was lower than that of myopia, which is consistent with the study conducted by Asgar Dostdar and his colleagues in 2017. In another study, the rate of hyperopia in girls in the age group of 10 years-20 years was reported as 9.5%. Considering the variability of the prevalence of myopia in the Iran, it seems that more studies are needed in this field.

However, since non-cycloplegic failure in this age group has a low sensitivity in diagnosing hyperopia, and because in Iran there is still no specific number for the high prevalence of this prevalence, it seems that the prevalence of hyperopia is high in our study. According to previous studies in Iran the prevalence of hyperopia among Iranians is higher than that of myopia. The prevalence of astigmatism in our study population was 14.52%, these results were consistent with the results of other studies, and the prevalence of astigmatism was 12.1% according to the rule, which is consistent with the results of studies in Shuzhou China and Weng, et al. But the comparison of the findings about astigmatism contrary to the rule was significantly more in girls than in boys, which needs more investigation and studies. Also, the prevalence of astigmatism in the study was relatively higher than other studies in Iran. And the study that was conducted reported the prevalence of astigmatism to be 10.5%. It has also been reported that the prevalence of astigmatism is different in different ethnic groups and races. Overall, it seems that both biometric and environmental factors may contribute to the increased prevalence of myopia in this age group. Another possible reason for the increase in myopia in this age group is the increase in the longitudinal axis of the body and the increase in work that requires close vision and requires special care by the health system during this period of time in this age group who are studying.

Conclusion

The results of this study showed that myopia is the most common refractive error in secondary school students in Kermanshah. Considering the high prevalence of myopia with astigmatism, it seems that screening programs to identify, and treat refractive errors in students of Kermanshah city and in general in the other city of Iran are particular importance and it should be done regularly and planned. It is also suggested that other studies be conducted to investigate the prevalence of refractive errors and their causes in Kermanshah city and other cities of Kermanshah province.

References

- Willis, J.R., et al. "Visual impairment, uncorrected refractive error, and accelerometer-defined physical activity in the United States". *Arch Ophthalmol*. 130.3 (2012):329-335.
- Dandona, R., & Dandona, L. "Refractive error blindness". *Bull World Health Organ*. 79 (2001):237-243.
- Fotouhi, A., et al. "The prevalence of refractive errors among schoolchildren in Dezful, Iran". *Br J Ophthalmol*. 91.3 (2007):287-292.
- Yekta, A., et al. "Prevalence of refractive errors among schoolchildren in Shiraz, Iran". *Clin Exp Ophthalmol*. 38.3 (2010):242-248.
- Jamali, P., et al. "Refractive errors and amblyopia in children entering school: Shahrood, Iran". *Optom Vis Sci*. 86.4 (2009):364-369.
- Yekta, A., et al. "The prevalence of visual problems in school children, Shiraz, Iran". *Iran J Epidemiology*. 6.3 (2010):8-18.
- Harb, E.N., & Wildsoet, C.F. "Origins of refractive errors: Environmental and genetic factors". *Annu Rev Vis Sci*. 15.5 (2019):47-72.
- Silva, L., et al. "The iridocorneal endothelial syndrome". *Surv Ophthalmol*. 63.5 (2018):665-676.
- Akhgari, M., et al. "Prevalence of refractive errors in different ages and gender, in patients examined in optometry clinic of rehabilitation of Shahid Beheshti medical university in 2008/2009". *Sci J Kurd Univ Med Sci*. 15.3 (2010):99-107.
- Khalaj, M., et al. "Refractive errors in school age children in Qazvin, Iran". *Biotech Health Sci*. 2014.
- Pi, L-H., et al. "Prevalence of eye diseases and causes of visual impairment in school-aged children in Western China". *J Epidemiol*. 22.1 (2012):37-44.
- Faghihi, M., et al. "The prevalence of refractive errors, strabismus and amblyopia in schoolboys of Varamin, Iran, in 2010". *Iran J Ophthalmol*. 24.2 (2012):33-39.
- Yekta, A., et al. "The prevalence of anisometropia, amblyopia and strabismus in schoolchildren of Shiraz, Iran". *Strabismus*. 18.3 (2010):104-110.
- Quek, T.P., et al. "Prevalence of refractive errors in teenage high school students in Singapore". *Ophthalmic Physiol Opt*. 24.1 (2004):47-55.
- He, M., et al. "Refractive error and visual impairment in school children in rural southern China". *Ophthalmology*. 114.2 (2007):374-382.
- Doostdar, A., et al. "Prevalence of Refractive Errors in 6-7 Years Old Children in the City of Fasa Iran". *J Paramed Sci*. 7.2 (2018):55-63.
- Hashemi, H., et al. "Prevalence of refractive errors among high school students in Western Iran". *J Ophthalmic Vis Res*. 9.2 (2014):232.
- Wang, X., et al. "Refractive error among urban preschool children in Xuzhou, China". *Int J Clin Exp Pathol*. 7.12 (2014):8922.
- Dirani, M., et al. "Dominant genetic effects on corneal astigmatism: The Genes in Myopia (GEM) twin study". *Invest Ophthalmol Vis Sci*. 49.4 (2008):1339-1344.
- Read, S.A., Collins, M.J., Carney, L.G. "A review of astigmatism and its possible genesis". *Clin Exp Optom*. 90.1 (2007):5-19.