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The Prevalence of Refractive Errors in Students from Basrah, Iraq

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A B S T R A C T

Introduction: Visual impairment affects students' routine in school time and day-to-day activities. This study aimed to describe the prevalence of refractive errors in students from Basrah, Iraq. **Methods:** This research was an observational study with a cross-sectional design. A total of 105 students participated in this study. The inclusion criteria for the participant were pediatric patients aged 6-15 years old who attended the private ophthalmological clinic in Basrah. The children were evaluated for refractive error by ophthalmologists using Snellen charts, auto refractometer, retinoscopy, and slit-lamp biomicroscopy. Obtained data were analyzed using the SPSS program version 24.0. **Results:** The prevalence of refractive error was found to be 37/105 (35.24%). The difference in the refractive error types between the students was found to be highly significant (p= 0.01). The majority of the students, 18(48.65%), reported myopia, followed by astigmatism 12(32.43%), and hypermetropia 7(18.92%). The difference in the proportion of risk factors such as watching TV, using a mobile, using a computer, playing video games, and having a family history of refractive error were found to be statistically significant (p-value ≤0.05). **Conclusion:** The prevalence of refractive errors is high in school students. The common refractive error was found to be myopia.

1. Introduction

Refractive error (ametropia) refers to a refractive condition other than emmetropia or a condition in which parallel rays of light fail to converge to a sharp focus on the retina. Refractive errors include myopia, hyperopia, and astigmatism.[1] It is evaluated by a mismatch between the two factors; cornea and lens refractive power and axial eye length.[2] The etiologies of ametropia include hereditary and environmental factors, although the exact reasons are still unknown.[3] Uncorrected refractive errors can cause visual impairment that leads to short-term and long-term consequences in adults and children. Loss of educational and career opportunities for individuals, families, and societies are because of uncorrected refractive errors, which result in a poor quality of life.[4,5]

In developing countries, 25% of the population includes children of the school-going age group, which falls under the preventable age group for correction of refractive errors.[6] Globally, it has been estimated that 19 million children have a visual impairment; of these, refractive errors account for 12 million.[7] Children are not aware of the problem, and they do not complain of defective vision. This necessitates early detection and management of ocular morbidity and visual impairment to prevent permanent visual defects.[8] This study aimed to describe the prevalence of refractive errors in students from Basrah, Iraq.

2. Methods

This research was an observational study with a cross-sectional design. A total of 105 students participated in this study. The inclusion criteria for the

participant were pediatric patients aged 6-15 years old who attended the private ophthalmological clinic in Basrah. The exclusion criteria were congenital eye disease, systemic disease, corneal opacities, scars of the cornea, and a history of ocular trauma. Written informed consent and the verbal ascent of each study participant were required before the study began. A questionnaire was given to the parents of the students who were having a refractive error. The period of this work extended from July 2020 to December 2021. This study has been approved by the local ethical committee of Basrah, Iraq.

The children were evaluated for refractive error by ophthalmologists using Snellen charts (E prototype, UK), auto refractometer (Topcon KR-800, Japan), retinoscopy (Riester, Germany), and slit-lamp biomicroscopy. Obtained data were analyzed using SPSS version 24.0 (IBM Inc., Chicago, IL, USA). The association between explanatory variables and categorical data was assessed by cross-tabulation and comparison of percentages. P value <0.05 was considered statistically significant.

3. Results

The prevalence of refractive error was found to be 37/105 (35.24%). The difference in the proportion of different age groups between the student classes was found to be insignificant. In addition, the difference in the proportion of different gender between the student was found to be insignificant (Table 1). The difference in the refractive error types between the students was found to be highly significant (p= 0.01). The majority of the students, 18(48.65%), reported myopia, followed by astigmatism 12(32.43%), and hypermetropia 7(18.92%) (Table 2). The difference in the proportion of risk factors such as watching TV, using a mobile, using a computer, playing video games, and having a family history of refractive error were found to be statistically significant (p-value ≤0.05) (Table 3).

Table 1. Demographic data of students.

Demographic	Frequency (%)	P value
Age (years)		
6 - 12	51 (48.57)	0.078
13 - 15	31 (29.52)	
16 - 18	23 (21.91)	
Gender		
Male	45 (42.86)	0.6
Female	60 (57.14)	

Table 2. Ophthalmological examination outcome.

Type of refractive error	Frequency (%)	P value
Myopia	18 (48.65)	0.01
Hypermetropia	12 (32.43)	
Astigmatism	7 (18.92)	

Table 3. Risk factors distribution.

Variables		Frequency (%)	P value
Watching TV	Yes	26 (70.27)	0.01
	No	11 (29.73)	
Mobile using	Yes	36 (97.30)	<0.001
	No	1 (2.70)	
Using computer	Yes	22 (59.46)	0.01
	No	15 (40.54)	
Playing video games	Yes	34 (91.90)	<0.01
	No	3 (8.10)	
Family history of refractive error	Yes	19 (51.35)	0.05
	No	18 (48.65)	

4. Discussion

The prevalence of refractive error was found to be high (35.24%), and the majority of the students had myopia (48.65%), followed by astigmatism (32.43%). The difference in the proportion of risk factors such as watching TV, using a mobile, using a computer, playing video games, and having a family history of refractive error were found to be statistically significant. Similarly, many studies reported an increase in the prevalence of refractive error.[10-15] Khandekar et al. reported a prevalence of refractory error of 5.46% in urban areas and 2.63% in rural areas. Also, they reported that refractory error was more in the age group 9-12 years, followed by 6-8 years.[11]

In India, a study by Triveni et al.,[16] the refractive errors were seen more in males, 52.63% from the urban area and 73.08% from the rural area. In a study by Khandekar et al., boys had a higher uncorrected refractive error, although gender was not significantly associated.[11] In contrast, studies by Vidusha et al.,[14] Prema et al.,[16] and Yadav et al.,[17] reported female preponderance for refractive errors in their works.

The main type of uncorrected refractive error was myopia in this study. Studies by Dandona et al.,[18] and Khandekar et al.,[11] found the prevalence of myopia to be low. Many studies reported myopia as the most common pathology among refractive errors.[14,19] Elevated prevalence of myopia in an urban population may be due to raised literacy rates, educational demands, and differences in lifestyle, for example, reading, watching TV, and using mobile and computer visual display units.[20]

Kumar et al., and Sharma et al., reported that refractive error was more common in students who watched TV/or computers for more than 3 hours.[21,22] Rathod et al.,[12] also reported that defective eye problem was more in that students who had a history of watching TV and using mobile. The presence of refractive error was significantly associated with a positive family history, as seen in other studies.[23-25]

Periodic and frequent eye check-ups are essential for school students and should be included in the school health screening programs, as early detection helps in the prevention of future complications. Parents and teachers should be educated about the importance of eye care and taught not to ignore any complaints from the children.[20]

5. Conclusion

The prevalence of refractive errors is high in school students. The common refractive error was found to be myopia. Periodic screening in school and preschool should be carried out to identify refractive errors at an earlier stage. Parents should be educated about the signs and symptoms of refractive errors.

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