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## RESEARCH ARTICLE

### PREVALENCE OF REFRACTIVE ERRORS AMONG SCHOOL CHILDREN IN WESTERN RAJASTHAN

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#### ABSTRACT

Child vision is essential for successful learning. This paper is focused on 1000 young school children, aged 8 – 16 years (class 4<sup>th</sup> – 10<sup>th</sup>). Convenient random sampling was adopted to select the schools in Jodhpur district in Rajasthan. Vision screening was done by a questionnaire comprised of two blocks, wherein block 1 belongs to identification that is name, age, class and sex of child. Block 2 comprised of relevant history and eye examination which included determination of visual acuity and retinoscopy. Result of this study shows that 10.2% of the students were found to have refractive errors. The distribution of refractive errors names: Myopia, Hypermetropia and Astigmatism were 56.9%, 13.7% and 29.4% respectively. This study also indicates that the percentage of ammetropic students increases accordingly as the level of education increases. The data's of present study concluded that visual impairment due to refractive errors in school children is large enough to be a public health problem.

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#### INTRODUCTION

Refractive errors are the most common cause of visual impairment and the second leading cause of treatable blindness, especially in developing countries. It has several social and economic effects on individuals and communities, restricting the educational and employment opportunities of otherwise healthy people. Child vision is essential for successful learning. Childhood visual impairment due to refractive errors is one of the most common problem in school children and second leading cause of treatable blindness Khalaj *et al.* (2009). Studies have shown that refractive errors in children cause blindness (<6/60 in better eye) up to 62.5% in Chile, 22% in Nepal, 77% in urban India and 75% in China. A refractive error is not a disease of eye, but it is an optic defect intrinsic to eye which prevents light from being brought to a single point focus on the retina, thus reducing normal vision Sethi *et al.* (2000). Emmetropia is the refractive state of the eye in which with accommodation at rest, parallel rays from a distant object are brought to a point focus on the retina. Ammetropia is the inability of the eye to accurately focus the rays of light on the retina from a distance. It is called refractive error. Three main types are considered as refractive errors: Myopia (nearsightedness), Hypermetropia (farsightedness) and Astigmatism. The prevalence of myopia is currently attracting worldwide attention as many studies report dramatic increase over the last 20 years Seet *et al.* (2001), Lin *et al.* (2004). Poor vision in childhood affects performance in school or at work and has a negative influence on the future life of the child. Moreover planning of a youth carrier is very much dependent on the visual acuity, especially in jobs for navy, military, railways and aviation Goswami *et al.* (1979). This warrants early detection and treatment of refractive errors to prevent permanent disability.

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#### MATERIAL AND METHOD

The present study was carried out in the schools of Jodhpur district. A total of 1000 students of both sexes in the age group 8 – 16 years, studying in classes 4<sup>th</sup> – 10<sup>th</sup> were included in this study. Convenient random sampling was adopted to select the schools in Jodhpur district in Rajasthan. Prevalence of refractive errors in school children were accessed by a questionnaire comprised of two blocks, where in block 1 belongs to identification that is name, age, class and sex of child. Block 2 comprised of relevant history and eye examination. History included headache, eyestrain, itching, watering, redness, use of spectacle. Every child was subjected to examination of eyes which included determination of visual acuity and retinoscopy. Presenting distant visual acuity was assessed by Snellen's chart at a distance of 20 feet (6mt). Visual acuity for near vision is tested by using Jaeger chart. This initial test of visual acuity identifies children whose vision is abnormal (<6/9) in either eye. Children with abnormal findings in above examination were examined further by retinoscopy in the OPD of Ophthalmology Department of MDM Hospital, Jodhpur. This study is an attempt to determine the overall prevalence of refractive errors, the distribution of individual type of refractive error and to find out correlation of educational status with refractive errors.

#### ANALYSIS OF DATA

Percentage analysis is one of the statistical measured used to describe the characteristics of the sample.

#### RESULT

Of the total 1000 students 10.2% of the students were found to have significant refractive errors (Table 1). In the present study among the various types of refractive errors, overall myopia was found in 58 (56.9%), hypermetropia in 14 (13.7%) and astigmatism in 30 (29.4%) cases (Table 2).

**Table 1. Prevalence of refractive errors**

Refractive Errors	Frequency	Percentage
Yes	102	10.2%
No	898	89.8%
Total	1000	100%

**Table 2. Distribution of individual type of refractive error**

Optical state	Frequency	Percentage (%)
Myopia	58	56.9%
Hypermetropia	14	13.7%
Astigmatism	30	29.4%

The present study indicates that the percentage of ametropic students increases accordingly as the level of education increases. In the class group 4<sup>th</sup> – 5<sup>th</sup> refractive error was 8.02%, in the 6<sup>th</sup> – 7<sup>th</sup> class group, it was 10.44% and in the 8<sup>th</sup> – 10<sup>th</sup> class group, it was 10.58 % (Table 3).

**Table 3. Class-wise distribution of individual type of refractive error**

Class Group	Total no. Of subjects	No. of cases of refractive errors	Percentage (%)
4 <sup>th</sup> – 5 <sup>th</sup> class	137	11	8.02%
6 <sup>th</sup> – 7 <sup>th</sup> class	249	26	10.44%
8 <sup>th</sup> – 10 <sup>th</sup> class	614	65	10.58%

## DISCUSSION

The results of our study are similar to the study carried out by Seema *et al.* (2009). They conducted a research on the magnitude of refractive errors among school children in Haryana. Out of total 1265 students tested, 172 children's (13.6%) were found to have defective vision. Similarly Das *et al.* (2007) studied the prevalence of refractive errors among school children in Kolkatta. They found that among various types of refractive errors, myopia was most prevalent affecting 55.84% children's. Our results are also in accordance with Mehari *et al.* (2012). In support to our findings Sethi *et al.* (2000) showed that the number of children's with refractive errors increased as they move to higher classes, implying thereby that a significant relationship exists between refractive errors and educational level. Bataineh HA et al (2008) observed that the percentage of ametropic children's among the 10<sup>th</sup> to 12<sup>th</sup> grade was significantly higher (d value= 3.96, P< 0.05) than the percentage of ametropic children's among the 7<sup>th</sup> to 9<sup>th</sup> grade because during this period they are subjected to cope up with the school and academic activities.

## CONCLUSION

The findings of present study concluded that visual impairment due to refractive errors in school children is large enough to be a public health problem. The effect of this can be reflected on the school performance of a child and also on his/her personal and behavioral development. The data's of present study support the assumption that vision screening of school children in developing countries could be useful in detecting correctable cause of decreased vision especially refractive errors and in minimizing long term visual disability.

## RECOMMENDATIONS

The present study shows that the adolescent age group (8-16 years) forms the high risk group for refractive errors and most of the children are unaware of refractive errors. Their correction in school children is particularly important as they carry the danger of causing 'amblyopia' and permanent visual loss, if uncorrected. Therefore, screening in school and preschool ages should be carried out periodically. In addition, children in these ages and their parents should be educated about sign and symptoms of refractive errors, ocular hygiene and for the risk factors involved in the development of these errors and other ocular pathological problems.

**CONFLICT OF INTEREST:** There is no conflict of interest.

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