

## Original Research Article

# Prevalence of refractive errors among school children of 6-12-years of age group and reason for not using spectacles even after correction

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## ABSTRACT

**Background:** As your eyes are one of the most important organ in the human body and vision is one of the most wonderful gift. But often many people neglect the importance of eye care and do not pay proper attention towards eye care. An estimated 180 million people world- wide are visibly disabled, of whom nearly 45 million are blind, four out of five of them live in developing countries. Blindness is one of the most significant social problems in India with uncorrected refractive errors as the second major cause accounting for 19.7% of blindness and low vision. Refractive error is an optical defect, intrinsic to the eye which prevents light from being brought to a single point focus on the retina, thus reducing normal vision. Diagnosis and treatment of refractive errors is relatively simple and is one of the easiest ways to reduce impaired vision. Three main types are considered as refractive errors: hypermetropia (farsightedness), myopia (nearsightedness) and astigmatism.

**Methods:** This study was conducted in various schools of Haryana. It included 1000 school going children of age group of 6 to 12 years enrolled in 6 rural schools (619 students) and 4 urban schools (381 students). Cases were defined as visual acuity <6/6 without spectacles. Details regarding socio-demographic factors and visual examination were noted in detail, follow up with children and their parents were conducted to know the reasons for not using spectacles even after correction.

**Results:** The study which included 620 students from rural schools and 380 students from urban schools revealed that prevalence of refractive errors was 7.0% in which Myopia is the most common refractive error 44(61.9%) followed by the astigmatism 16(24.1%) and Hypermetropia (14%) among the children with Refractive Errors.

**Conclusions:** Now a day, refractive error is increasing due to edu-comp smart classes in school or use of laptops, TV viewing and computers or mobiles and if not diagnosed earlier and not managed timely can lead to complication like amblyopic and strabismus and some other ocular pathologies etc.

**Keywords:** Astigmatism, Hypermetropia, Myopia, Prevalence

## INTRODUCTION

As you know eyes are one of the most important organ in the human body and vision is one of the most wonderful gift. But often many people neglect the importance of eye care and do not pay proper attention towards eye care.<sup>1</sup>

An estimated 180 million people world- wide are visibly disabled, of whom nearly 45 million are blind and four

out of five of them live in developing countries. Blindness is one of the most significant social problems in India with uncorrected refractive errors as the second major cause accounting for 19.7% of blindness and low vision. Refractive error is an optical defect, intrinsic to the eye which prevents light from being brought to a single point focus on the retina, thus reducing normal vision. Diagnosis and treatment of refractive errors is relatively simple and is one of the easiest ways to reduce

impaired vision. Three main types are considered as refractive errors:

- Hypermetropia - (far-sightedness), myopia (near-sightedness) and astigmatism<sup>2,3</sup>
- Myopia - (near-sightedness) parallel rays come from infinity are brought to focus in front of retina.
- Hypermetropia - (far-sightedness)-parallel rays coming from infinity are brought to focus behind retina.
- Astigmatism - this is distorted vision resulting from an irregularly curved cornea.<sup>4</sup>

The prevalence of myopia is currently attracting worldwide attention as many recent studies report dramatic increases over the last 20 years. Moreover, planning of a youth's career is very much dependent on the visual acuity, especially in jobs for navy, military, railways and aviation.<sup>5</sup> This warrants early detection and treatment of refractive errors to prevent permanent disability. Diagnosis and treatment of these errors is relatively simple and is one of the easiest ways to reduce impaired vision.

## METHODS

This study was conducted in various schools of Haryana. It included 1000 school going children of age group of 6 to 12 years enrolled in 6 rural schools (619 students) and 4 urban schools (381 students). Cases were defined as visual acuity 6/6 or worse without spectacles. Details regarding socio-demographic factors and visual examination were noted in detail, follow up with children and their parents were conducted to know the reasons for not using spectacles even after correction.

All School going children (6-12 years) with visual acuity 6/6 or worse were subjected to refraction test at the school. Subjective refraction was performed by achieving best corrected visual acuity using Snellen's chart, Retinoscopy and auto refraction, while cycloplegic refraction and, examination of the anterior segment and ophthalmoscopic examination of the posterior segment and ocular motility evaluation was advised for children when best corrected visual acuity could not be achieved.

School teachers available at the time of data collection and who willing to participate in the study were included in the study.

School children presenting organic defects in eye such as corneal opacity, opacity of the lens, choroid and retinal disorders and absentees on the day of examination or not willing to participate were excluded from study.

## RESULTS

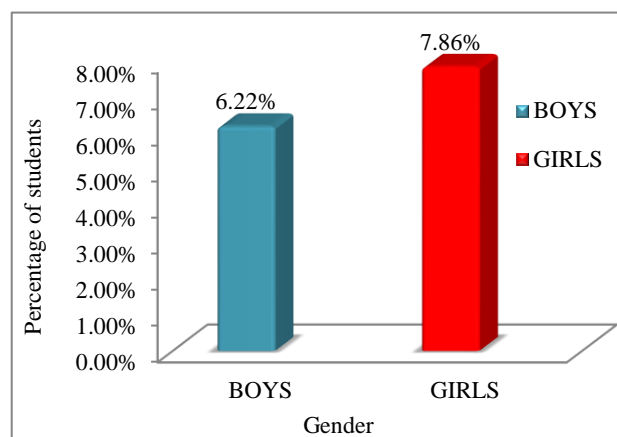
The study which included 619 students from rural schools and 381 students from urban schools revealed that prevalence of refractive errors was 7.0% in which myopia

is the most common refractive error 43 (61.9%) followed by the astigmatism 17 (24.1%) and hypermetropia 10 (14%) among the children with refractive errors (Table 1).

**Table 1: Distribution of refractive error.**

Types of refractive error	No. of children	% in the study group	% among the cases
Myopia	43	4.3	61.9
Hypermetropia	10	1.0	14
Astigmatism	17	1.7	24.1
Total	70	7.0	100

Female students (7.86%) were affected more than males (6.22%) (Figure 1). Positive family history, Prolonged Mobile viewing, TV viewing and computer viewing were significantly associated with prevalence of refractive errors ( $p>0.05\%$ ) in which watching TV 67 (6.7%) and computer 65 (6.5%) for 1-2 hours followed by student watching TV and computer for >3 hours, 4 (0.4%) and 6 (0.6%) respectively.



**Figure 1: Gender wise distribution of refractive errors.**

Further the result of the study showed that 88.7% refractive errors were correctable using spectacles or lenses. However, 11.3% students did not show improvement even on prescribing glasses (Table 2).

**Table 2: Distribution of students with correctable and non-correctable refractive error.**

Refractive error	Number of children	%
Correctable	62	88.7
Non-correctable	08	11.3
Total	70	100

After examining the school children spectacles were prescribed to all 70 students having refractive error (Table 3). Follow up after 3 months found that 37 students were wearing spectacles while the rest 33 students did not wear the spectacles even after

prescription. 53.5% of the cases were using spectacles 46.5% were not (Table 4). Common reasons were no felt need for spectacles and headache after wearing spectacles and teasing from their friends.

**Table 3: Age wise distribution of students with refractive error.**

Age in years	Refractive errors		Total
	Present	Absent	
6-8	22 (5.27%)	396 (94.73%)	418 (100%)
9-10	33 (7.54%)	405 (92.46%)	438 (100%)
11-12	16 (11.11%)	128 (88.89%)	144 (100%)
Total	70 (7.0%)	929 (92.9%)	1000 (100%)

**Table 4: Distribution of students on follow up after 3 months.**

	Number of children	%
Wearing spectacles	37	53.5
Not wearing spectacles	33	46.5
Total	70	100

## DISCUSSION

In our study the prevalence of refractive errors was 7.0%. The overall incidence in India has been reported to vary between 21% and 25% in patients attending eye outpatient departments.<sup>6</sup> Similar prevalence of refractive errors has been observed among children of 12-17 years in Ahmedabad city.<sup>7</sup>

About (32%) prevalence rate of refractive errors has been reported among school children of age 3-18 years from South India.<sup>8</sup>

However, Matta et al reports a prevalence of 12.5%.<sup>9</sup> Datta et al report a low prevalence of refractive errors (2%) from Eastern India among primary school children (5-13 years), which could not be explained.

In this study reports prevalence of myopia, hypermetropia and astigmatism 6-12 years children as 61.9%, 14% and 24.1%, respectively.

Internationally, lower prevalence of refractive errors (2.7-5.8%) has been reported among children of age 5-15 years from Africa, Finland, and Nepal as compared to the present study.<sup>10-13</sup>

These differences may be explained by the different diagnostic criteria used by different authors, racial or ethnic variations in the prevalence of refractive errors, different lifestyles or living conditions.

High rate of refractive errors in our study population can also be attributed to different lifestyles or living conditions like watching TV for long hours or using computers.

## CONCLUSION

Now a day, Refractive Error is increasing due to Edu-comp smart classes in school or use of laptops, TV viewing and computers or mobiles and if not diagnosed earlier and not managed timely can lead to complication like amblyopic and strabismus and some other ocular pathologies etc. Routine eye examination of children and further emphasizing the importance of regular spectacle wearing can lead to better prognosis.

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