



PREVALENCE AND PATTERN OF REFRACTIVE ERRORS AMONG SCHOOL-GOING CHILDREN VISITING AN OPTICAL PRACTICE: A CROSS-SECTIONAL STUDY

Ophthalmology

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ABSTRACT

Refractive errors stand out as some of the main causes of blindness among children in schools and also pose major public health challenges today. Uncorrected refractive errors can adversely impact their academics and other areas of life. Factors like increased screen time, long hours of close work, and limited participation in outdoor games and activities have been blamed for the increasing prevalence of refractive anomalies in children. This study sought to establish the prevalence and patterns of refractive errors among children in schools accessing an optical practice. In addition, visual improvement among those subjected to corrective refractions was evaluated. A cross-sectional observational study was conducted involving 85 children ranging from 9 to 18 years of age accessing an optical practice for vision assessment. Ocular evaluation involved taking a detailed history from participants as well as performing Snellen chart visual acuity measurements and subjective refractions. Analysis of data involved the use of percentage distribution, means, standard deviations, confidence intervals, and the chi-square test. Among the subjects examined, 64.70% had refractive errors while 35.29% had emmetropia. Myopia was the most prevalent refractive error (50.90%), followed by astigmatism (32.72%) and hyperopia (16.36%). A large proportion of participants were prescribed spectacles for the first time (38.82%). After correcting their refractive problem, the percentage of children able to attain a visual acuity of 6/6 was as high as 94.54%. Refractive problems are common among school-going children, and the leading one is myopia.

KEYWORDS

Refractive error, Myopia, School children, Visual acuity, Pediatric optometry

INTRODUCTION

Refractive errors are considered the most common cause of childhood visual impairment across the globe and still continue to be an important public health problem (Resnikoff et al., 2008). Refractive errors develop as a result of incorrect focusing of light rays on the retina, causing visual distortion. Myopia, hyperopia, and astigmatism are the main types of refractive errors that can easily be corrected by wearing glasses. However, due to late detection and non-existence of regular eye examinations, many children suffer from refractive errors (Dandona & Dandona, 2001).

Good eyesight plays a critical role in achieving academic success and social interactions, and children who do not have clear vision tend to perform poorly in reading, concentrating, education, and daily activities. In recent times, increased use of cell phones, excessive near work, academic pressure, and low exposure to the outdoors have played a significant role in the rising prevalence of refractive abnormalities, particularly myopia, among school-going children (Holden et al., 2016; Pan et al., 2012).

Many studies carried out in the urban pediatric population have shown increased prevalence of refractive errors in children and adolescents (Saxena et al., 2015). Untreated refractive errors during childhood can result in amblyopia, visual discomfort, binocular vision disorders, and poor educational outcomes. Hence, early detection and prompt correction of refractive errors are essential.

Earlier studies have mostly been centered on school screening and hospital-based studies. There is a lack of scientific literature on the refractive error patterns in children attending optical practices for vision evaluation and spectacle fitting. Thus, the current study was done to determine the prevalence and refractive error pattern in children studying at schools who attended an optical practice.

MATERIALS AND METHODS

A cross-sectional observational study was carried out at Xpert Optician, New Delhi, for a duration of six months starting from November 2025 till May 2026. The sample size included 85 children who had come to the optical clinic for vision screening and refraction check-up and were aged between nine and eighteen years old.

Those individuals older than 18 years, suffering from ocular disorders, past ocular surgeries, and lack of cooperation during the eye examination were not included in the study. Information on the patient's age, gender, presenting symptoms, and history of spectacle prescription was gathered for each individual.

Detailed ocular examination involved checking visual acuity with Snellen's chart and subjectively assessing the refractive error. Prescriptions for spectacles were made whenever necessary.

Data collection was statistically evaluated through Microsoft Excel and SPSS programs. Various tests applied during analysis included frequency distribution, percentage, arithmetic mean, standard deviation, confidence interval, and Chi-square test.

RESULTS

In total, 85 children were recruited into the study. The 16-18 years age category formed the largest group (38.82%), followed by the 13-15 years category (35.29%) and the 9-12 years category (25.88%). Out of the total participants, males constituted 58.82%, while the rest (41.17%) were females.

The prevalence rate of refractive errors was 64.70%, while emmetropia prevalence stood at 35.29%. Of the different types of refractive errors, myopia was the most prevalent (50.90%), followed by astigmatism (32.72%) and hyperopia (16.36%).

As far as spectacles use was concerned, 38.82% of children needed spectacle prescription for the first time, while 25.88% used spectacles. After refractive correction, 94.54% attained 6/6 visual acuity, while the remaining 5.45% registered an improved condition partially.

The mean age of the participants was found to be 14.25±2.58 years. Statistical analysis showed no significant association between gender and refractive error prevalence ($p > 0.05$).

DISCUSSION

The results obtained from the current study show the high incidence of refractive errors in school-going children in an optical clinic. The most frequently observed refractive error was myopia. This finding has also been demonstrated in prior studies on urban pediatric patients (Holden et al., 2016; Saxena et al., 2015).

The increasing incidence of myopia can be attributed to factors such as increased near work and use of digital devices, learning pressure, and limited outdoor activity. This observation is comparable to observations made in prior research conducted on refractive errors in school-age children (Pan et al., 2012).

A considerable proportion of children in the present study were identified as first-time spectacle users, indicating delayed diagnosis and poor awareness regarding routine eye examinations. This finding highlights the importance of regular vision screening programs and pediatric eye care awareness among parents and teachers.

One of the most important findings of the study was the significant improvement in visual acuity following refractive correction. Most participants achieved normal visual acuity after appropriate spectacle prescription, demonstrating that refractive errors remain one of the most easily manageable causes of visual impairment among children.

Unlike many previous school-based studies, the present research was conducted in an optical practice setting, thereby providing practical clinical insight regarding refractive patterns, spectacle usage, and healthcare-seeking behavior among pediatric patients.

CONCLUSION

The present study concludes that refractive errors are highly prevalent among school-going children, with myopia being the most commonly observed refractive abnormality. Early diagnosis and appropriate spectacle correction significantly improve visual acuity and help reduce avoidable visual impairment among children. Routine pediatric eye examinations, increased awareness regarding eye health, and regular vision screening programs are essential for early detection and management of refractive errors among school-going children.

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