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Original Research Article

Study of Increased Prevalence of Refractive Error in Pediatric Age Group at Dr. M.K. Shah Medical College & Research Centre, Chandkheda, Ahmedabad

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Conflict of interest: Nil

Abstract:

Background and Aim: Vision is critical in a child's development for learning and communication. Uncorrected refractive error (URE) has become a major issue for health-care policymakers, particularly among school-age children. The purpose of this study was to evaluate the prevalence of refractive error in school students and its associated risk factors over a one-year period at Tertiary Care Teaching Institute of India.

Methods and Materials: The purpose of this cross-sectional study was to determine the prevalence of refractive error and its associated characteristics among school children in selected Gujarat schools. A sample size of 200 was used. Department of Ophthalmology, Dr. M.K.Shah Medical College & Research Centre, Chandkheda, Ahmedabad, organized the current study. A semi-structured questionnaire was utilised to collect information, and refractive errors were also tested for. SPSS was used to analyse the data.

Results: Among the study participants, 8 (4%) were 10 years old, 58 (29%) were 11 years old, 66 (33%) were 12 years old, 56 (28%) were 13 years old, and 12 (6%) were 14 years old. Boys outnumbered girls 55% (110) to 45% (90). The prevalence of refractive error was found to be significantly related to age, parental education and occupation, socioeconomic position, and parental history of refractive error, duration of watching television, and body mass index.

Conclusion: Many eye disorders begin in childhood, and the morbidity may go unrecognised, affecting the child's academic performance and causing significant ocular handicap later in life. As a result, the study emphasises the significant prevalence of undiscovered refractive error in school children, as well as the significance of early detection and treatment with corrective spectacles to arrest the progression of refractive error.

Keywords: Prevalence Refractive Error, School Children, Vision.

Introduction

Vision is crucial in a child's development for learning and communication.[1] The ultimate shaping of a person's personality and potentiality is determined by his nature, surroundings, and eye sight quality." Vision screening in school children should be done very successfully to discover refractive problems, the correctable cause of impaired vision. Children of school going age account for 25% of the population in developing countries. The two most common causes of vision impairment are cataracts and refractive errors. The most prevalent ailment requiring treatment at the ophthalmology outpatient department is refractive error. [2,3] According to global data, uncorrected refractive errors (43%), unoperated cataract (33%), and glaucoma (2%), are the primary causes of visual impairment. [4] Active screening and appropriate intervention not only aid in vision restoration, but also influence a child's growth and development. [5,6] A variety of environmental factors linked to socioeconomic position and lifestyle have been identified and are largely

thought to be responsible for these changes. The complicated combination between genetic predisposition and environmental exposures is also seen as significant evidence for refractive problems.

Myopia may be caused by prolonged near-work activity, inappropriate and delayed refractive correction, incorrect reading posture or habits, insufficient rest for eye functions, a lack of outdoor activities, excessive television watching, and an increase in computer activity. [7] The School Health Programme is envisioned as a key tool for providing future generations with preventive and curative health care.

The purpose of this study was to evaluate the prevalence of refractive error in school students and its associated risk factors over a one-year period at Tertiary Care Teaching Institute of India.

Material and Methods

The purpose of this cross-sectional study was to determine the prevalence of refractive error and its associated characteristics among school children in selected Gujarat schools. All 6th to 8th grade boys and girls from chosen schools were included. Department of Ophthalmology, Dr. M.K.Shah Medical College & Research Centre, Chandkheda, Ahmedabad, organized the current study. Absentees who were not present on the day of data collection were excluded.

The sample size is computed using a 10% projected mean prevalence. The sample size derived is 200, with a confidence range of 95%, absolute precision of 3%, and 10% surplus sampling to allow for non-response.

The first stage was a basic random sampling procedure, followed by a stratified sampling of schools, and all students from sixth to eighth grade were included in the study. A validated pretested semi structured questionnaire was created. It includes the individual's and family's socio-demographic information, refractive error history, parental and sibling refractive error history, time spent near work, and outdoor activities. Under the direction of the investigator, vision screening was performed with the assistance of an experienced optometrist.

Statistical analysis

The collected data was assembled and input into a spread sheet programme (Microsoft Excel 2007) before being exported to the data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). Based on their distribution, quantitative variables were described as means and standard deviations or median and interquartile range. The qualitative factors were shown as counts and percentages. The confidence level and level of significance for all tests were set at 95% and 5%, respectively.

Results

In this cross-sectional study, 200 schoolchildren from randomly selected schools were included to evaluate the prevalence of refractive error in schoolchildren as well as the disease's associated characteristics in the study population.

Among the study participants, 8 (4%) were 10 years old, 58 (29%) were 11 years old, 66 (33%) were 12 years old, 56 (28%) were 13 years old, and 12 (6%) were 14 years old. Boys outnumbered girls 55% (110) to 45% (90). Overall, there was an equal distribution of participants in both public and private schools, with 32% of participants in sixth grade, 35% in seventh grade, and 33% in eighth grade.

The majority of participants (70%) came from nuclear families, whereas 26% came from three-generation families. Based on the Modified BG Prasad scale, socioeconomic classification revealed that only 7% belonged to class I, 18% to class II, 25% to class III, 36% to class IV, and 14% to class V. (Table 1). Among the schools visited (n=200), 40 students (20%) experienced refractive error, while the remaining 160 students (80%) had no refraction difficulties in both eyes. Private school pupils had a 26% rate of refractive error, whereas government school students had just a 14% prevalence. A statistically significant relationship was discovered between private school students and the occurrence of refractive error.

The relationship between increasing age and refractive error was determined to be statistically significant. Gender and refractive error had no statistically significant relationship. It demonstrates that the occurrence of refractive error increases as one's socioeconomic status improves, and a statistically significant connection was discovered. Blurred vision was the most prevalent symptom, followed by double vision, headache, discomfort, wetness, pain, and redness.

Among the participants, had parental history of refractive error and 6% had sibling history of refractive error in the family? It demonstrates that 10% of research participants did not spend time playing outside. 30% of the participants were spending 30 minutes, 48% were spending about 1 hour per day in playing outdoors.

Table 1: Socio demographic details of the study participants

Variables	Number	Percentage (%)
Gender		
Male	110	55
Female	90	45
Type of family		
Nuclear	140	70
Three generation	52	26
Joint family	8	4
Socio economic status		
>6003	14	7
3002-6002	36	18
1801-3001	50	25
901-1800	72	36
<901	28	14

Table 2: Prevalence of Refractive error among participants

Variables	Number	Percentage (%)
Refractive error		
Present	40	20
Absent	160	80

Discussion

Screening programmes in schools are largely intended to detect refractive problems, but the health services supplied are insufficient due to a lack of resources and infrastructure.8 Uncorrected refractive errors (43%) are the leading cause of moderate and severe vision impairment worldwide. 80% of all visual impairment is preventable or curable. In the current study, 40 schoolchildren (20%) had refractive error among the schools visited. This is comparable to the study conducted by Joice et al in Puducherry, which found a prevalence of 20.9%. [9] Myopia was the most frequent refractive error in the research sample, with only 1% experiencing hypermetropia. Mutti et al discovered that myopia was present in 18.3% of eighth grade students and hyperopia was present in 7.7%. [8] Lin et al. conducted a survey in Taiwan to evaluate the prevalence and severity of myopia among school students, and found that the rate of myopia grew from 20% at 7 years to 61% at 12 years, and 81% at 15 years. [10] Myopia was the most prevalent refractive error in the research sample (19.7%), with only 0.7% experiencing hypermetropia. Mutti et al discovered that myopia was present in 18.3% of eighth grade students and hyperopia was present in 7.7%. [8] The conclusion that increasing age was related with an increased risk of myopia is similar with the findings of Sun et al. [11] when compared to males, girls were more affected by refractive errors, and numerous studies have confirmed comparable findings. [12,13] According to Gouda SM et al., male dropout rates in Sikkim were higher than female dropout rates (8.8%). [14]

Saw et al. discovered a similar positive relationship between higher myopia prevalence rates and more advanced father and mother education levels. [15] This is most likely attributable to increased parental pressure to devote more time to academic activities. Kamath et al. also discovered that refractive error was the most common condition among private school children (6.5%). [16] Children with one or two myopic parents had two times and eight times the chance of getting myopia, respectively, than those with no myopic parents. [17] Mutti et al found that children with myopia spend more time doing near activities and less time doing sports (p=0.0003) than emmetropes. [8]

Many more youngsters are afflicted by refractive error than children who use computers for less than two hours per day and watch a lot of television. [18] A statistically significant unfavourable relationship was also discovered between refractive error and outdoor activities. [18] Various factors such as nutrition, lifestyle, and heredity may all play a role in the rise of refractive errors.

The study's limitation was that it was conducted solely on school-aged children, which limits the generalizability of the findings. Because a high proportion of children in rural India are dropouts and do not attend school, measuring visual impairment in children requires population-based research rather than studies limited to school-age children. Only the refractive status of schoolchildren was tested in this study, and other ocular morbidities in schoolchildren such as Vitamin A insufficiency, conjunctivitis, and other reasons were not included.

Conclusion

Many eye disorders begin in childhood, and the morbidity may go undiagnosed, affecting the child's academic performance and causing

significant ocular handicap later in life. As a result, the study emphasises the significant prevalence of undiscovered refractive error in schoolchildren, as well as the significance of early detection and treatment with corrective spectacles to arrest the progression of refractive error. School teachers' awareness should also be raised, and they should take an active role in identifying ocular issues and sending patients for timely treatment. Computer use and other near-work activities must be reduced. Parents are adamant that their children participate in as many outdoor activities as possible. In the future, more precise and standardised technique for assessing near work will be required, allowing for more precise comparison between different researches. The impact of eye diseases is greatly influenced by timely access to quality care.

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