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A Cross-Sectional Study on Prevalence of Refractive Errors Among School Children in Thiruvallur District, Tamilnadu

KEYWORDS

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ABSTRACT *Background: Refractive Error is an avoidable cause of visual impairment. Diagnosis and Treatment of refractive errors is the simplest and most effective forms of eye care. Aims & Objective: To study the prevalence of refractive errors, among school children. Materials & Methods: This was a Cross-sectional study conducted in two government schools in Thiruvallur District. Children from both schools were screened for refractive errors. The distant vision of a child was tested utilizing Snellen's chart. The visual acuity was tested with the chart at 6 meters. If uncorrected vision was <6/12 in either eye, the child was declared to have defective vision. Results: Among 314 students screened 23 (7%) had refractive error in both eyes and 29 (9%) had only in left eye and 32 (10%) only in right eye. Conclusion: The study clearly indicates the prevalence of refractive errors among school going children in rural Thiruvallur District, Tamilnadu. The awareness among school teachers should also be improved and they should play an active role in identifying the refractive errors and referring them for timely management. Periodic screening of school children is very essential to improve the quality of eye-sight.*

Introduction:
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. One third of the world's blind (about 15 million) are in SEAR (South east Asian region) and 50 % of world's blind children live in this region. 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 [1].School health is an important aspect of any community health program. The school age is a formative period, physically as well as mentally, transforming the child into a promising adult. Health habits formed at this age will be carried to adult age, old age and even to the next generation. Poor vision in childhood affects performance in school and has negative influence on the future life of the child. Integration of vision screening and refractive services for school student with screening for health issues is recommended by World Health Organization [2, 3].. Refractive error is an optic 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 way to reduce impaired vision. Yet, in India refractive error is the second major cause for patients to consult ophthalmologists.

Refractive errors constitute a sizeable proportion of any large eye OPD in our country. The overall incidence has been reported to vary between 21% and 25% of the patients attending eye OPD in India [4]. Childhood blindness is one of the priorities in Vision 2020: the right to sight [5]. It is estimated that there are 1.4 million blind children in the world, two thirds of whom live in the developing countries, and of all the blind children it is estimated that 2,70,000 live in India [6]. Blindness is one of the significant social problem in India. About 80% of it is avoidable blindness, but a large number of those affected remain blind due to lack of access to eye care. Uncorrected refractive errors are responsible for about 19.7% of blindness [7]. About 13% of Indian population is in the age group of 7-15yrs. And about 20% of children develop refractive error by the age of 16 years [8].

Aims & Objective: To study the prevalence of refractive errors, among school children.

Materials and Methods:
This was a Cross-sectional study conducted in two government schools in Thiruvallur District. Prinicipal of the concerned schools were approached for permission to screen the children for refractive errors. Verbal consent was obtained from the respective principals, class teachers and parents. Children from both schools were screened for refractive errors. The distant vision of a child was tested utilizing Snellen's chart. The visual acuity was tested with the chart at 6 meters. If uncorrected vision was <6/12 in either eye, the child was declared to have defective vision.

Inclusion Criteria: 3rd standard to 10th standard (age 7-15) and those who are present on the day of examination were included.

Exclusion Criteria: below 3rd standard and mentally retarded children.

The data was entered in the Microsoft Excel and descriptive analysis was done using the Microsoft Excel.

Results:
The study population comprised of 314 students, out of which 153(49%) are Males and 161(51%) are females.

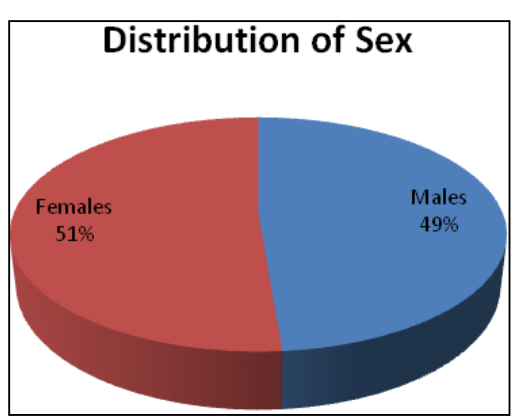

Figure: 1

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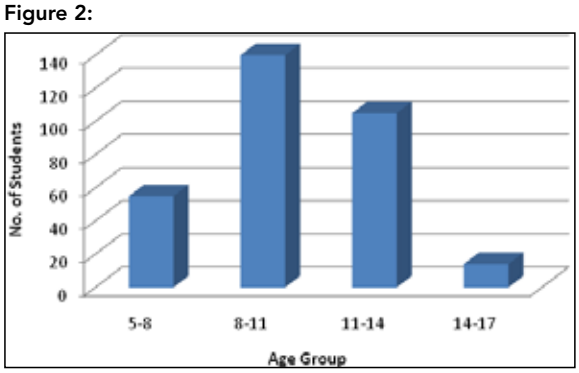
The age distribution of the school children are as follow (Table: 1 & Figure 2). Around 44.6% of the children are in the age group of 8-11 years followed by 11-14years (33.4%).

Table :1 Age Distribution of school children

S.No	Age Group	No of Children
1	5-8	55 (17.5%)
2	8-11	140 (44.6%)
3	11-14	105 (33.4%)
4	14-17	14 (4.5%)

Figure 2:



Among 314 students screened 23 (7%) had refractive error in both eyes and 9 (3%) had only in left eye and 6 (2%) only in right eye (Figure: 3).

Among 153 males 17 (11%) had right eye refractive error and 16 (10%) had left eye error (Figure: 4). Among 161 females 15 (9%) had right eye error and 13 (8%) had left eye error (Figure: 5).

Figure: 3

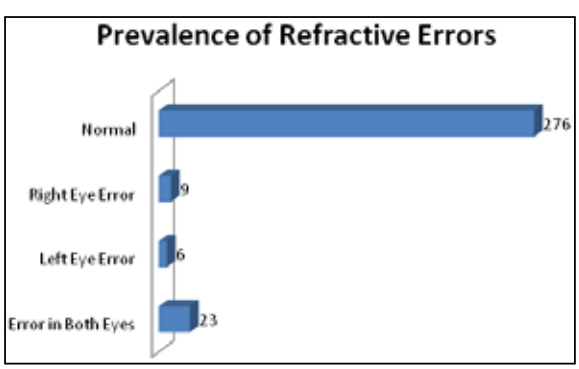


Table: 2: Association of having a refractive error in both eyes

Eye	Yes	No	Total
Left	29	285	314
Right	32	282	314
Both Eyes	23	291	314

Table 2 shows the association of having a refractive error in both eyes (P=<0.001) which is highly significant and it shows that a person who has a refractive error in either of the eyes (either right or left) will have it in both eyes.

Figure: 4

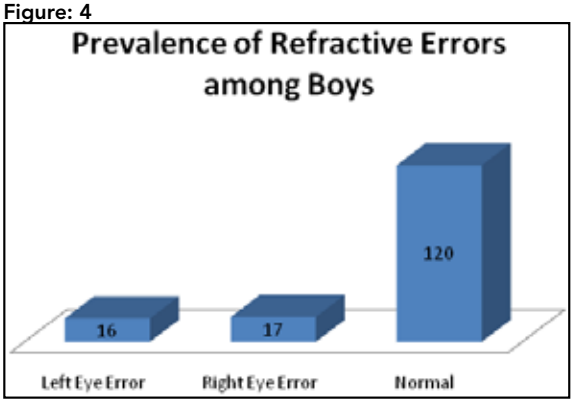
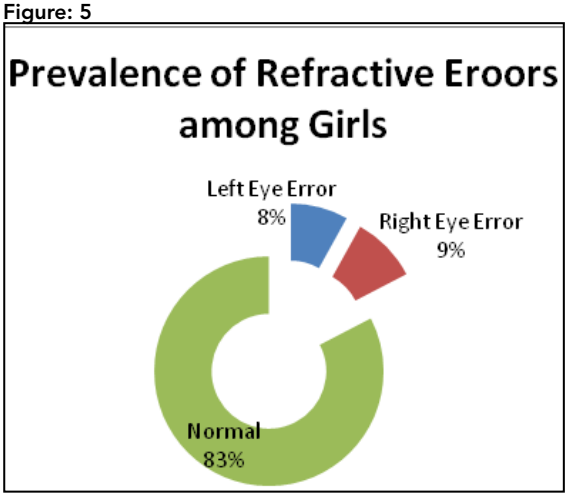


Figure: 5



Discussion:

In India, as in other developing countries, the school health services provided are hardly more than a token service because of shortage of resources and insufficient facilities [1]. The refractive services provided as a part of school health programme in the schools included in this study was poor in both urban and rural areas.

The prevalence of refractive error in this study population was 7% similar to the prevalence observed by GVS Murthy et al in New Delhi (6.4 %.)[9] and Kumar et al in Lucknow (7.4%) [10]. But less compared to the prevalence observed by Seema S et al in Haryana (13.65).[11] Similar studies from different parts of the world showed a prevalence of (8.2%) in Baltimore (USA) [12], (12.8%) in Shunyi district in China[13], (2.9%) in Nepal[14], (15.8%) in Chile [15]. These variations in the prevalence data from studies in different parts of the world are due to different operational definitions considered by investigators and also due to differences in demographic factors.

The current study shows the association of having a refractive error in both eyes (P=<0.001) which is highly significant and it shows that a person who has a refractive error in either of the eyes (either right or left) will have it in both eyes.

In the current study the refractive error was more among male children (21.5%) than the female children (17%) which are contradictory to the following studies Seema Sharma et al found that prevalence of refractive error was 23.7% in girls and only 12.2% in boys.[10] Similar results were found by Tay MT et al in their study on young Singaporeans. They related this high prevalence to the higher rate of growth in girls and also because girls attain puberty earlier than boys. [16]

Limitations of our study is only school going children were included in the study. Significant proportion of children in rural

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India and other developing countries do not go to schools; hence a more complete assessment of visual impairment in children would be possible with population based studies not restricted only to school going children. Population based studies covering the non-school going children are recommended.

Conclusion:

The study clearly indicates the prevalence of refractive errors among school going children in rural Thiruvallur District, Tamilnadu. In India Vitamin A deficiency and refractive errors are the most common ocular disorders identified which are the preventable and treatable causes of childhood blindness and visual impairment identified by the World Health Organization under Vision 2020 programme. Both these conditions can be easily identified by regular eye screening programmes and promptly treated so that the future citizens of our country are protected from becoming blind. The awareness among school teachers should also be improved and they should play an active role in identifying the refractive errors and referring them for timely management. Periodic screening of school children is very essential to improve the quality of eye-sight.

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