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ORIGINAL ARTICLE

A STUDY ON PREVALENCE OF REFRACTIVE ERRORS IN SCHOOL CHILDREN

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ABSTRACT: ''Sarvendriya nam nayanam pradhanam" Of all the organs in the body, eyes are the most important. The blindness or defect in vision decreases the productivity of the nation in addition to increased dependability. The refractive errors in the school children throw them in to defective future. Nutrition deficiency, mental strain, wrong reading habits etc are some of the causes for this defect in these children. Vision is essential for all the children, for the academic and overall development of the now children who are the future Indian Citizens. An attempt was made to study the prevalence of refractive errors in school children. The Lions clubs International has come forward to present the spectacles to all the needy children to correct the refractive errors. **MATERIALS & METHODS**: By Quantitative method--History taking from all the students by questionnaire method using a preformed structural format and all the visual acuity was clinically examined thoroughly using Snellen's chart, pinhole occlude for all the students. Colour vision was also tested using Ishihara chart.500 students participated in cross sectional study. The results were analyzed using Microsoft excel. 21.4% eat carrot daily, 15.9% eat weekly one, 20.2% eat weekly twice, 27.1% eat monthly once, 23.8% eat monthly twice, and 26.4% do not eat carrot at all. Defective vision is more prevalent in children eating carrot once in a month. 6.7% eat green leafy vegetables daily, 21% eat weekly once, 21.9% eat weekly twice, 13.6% eat monthly once, 27.3% eat monthly twice, and 33.3% do not eat at all. Defective vision is more common in children who do not eat green leafy vegetables at all.19.9% eat fruits daily, 24.9% eat weekly once, 21.3% eat weekly twice, 20% eat monthly once, 6.7% eat monthly twice and the remaining 50% do not eat fruits at all. Defective vision is more common in children who do not eat fruits at all. All the students with refractive errors were provided with appropriate suitable prescribed glasses by Lions Vice Governer Ln Upendra Mulpori.

KEYWORDS: Refractive errors, defective vision

INTRODUCTION: Refractive errors are the common problems in school going children now a days. Most common cause of vision defects in this age groups are mainly due to nutrition deficiency, mental strain, wrong reading habits. Mental strain puts corresponding physical strain on the eyes, their muscles and nerves.

The vision defects are mainly due to mental strain owning to overwork, fear and anxiety. The eyes need to have proper blood supply and functioning nerve for proper vision. Any factor effecting these blood vessels or nerves of the eyes could cause defective vision. The muscle paralysis is one of the main causes of defective vision.

School going age is important as the children in this age are subjected to a huge change in behaviour, diet, psychology and many more aspects.

Vision is essential for all the children, for the academic and overall development. With this background in view, an attempt was made to study the prevalence of refractive errors in school children. The Lions clubs International has come forward to present the spectacles to all the needy children to correct the refractive errors.

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AIM: To find out the prevalence of refractive errors in school going children.

OBJECTIVES: To find out role of diet (green leafy vegetables, milk, carrot) in causing visual problems, role of computer, mobile & video games effect on vision, role of family history in causing defective vision.

MATERIALS & METHODS:

Quantitative method:

- History taking from all the students was done by questionnaire method using a preformed structural format.
- All the study groups visual acuity were clinically examined thoroughly using snellen's chart, pinhole occlude.
- Colour vision is also tested using Ishihara chart.

Study Design: Cross sectional study-random sample.
Study Area: Schools in rural area- Veleru & Veeravalli.
Study Population: School children of:

- Urdu school.
- Veleru High school.
- Mandal praja parishad high school.
- Veeravalli high school.
- CSI elementary high school.

Study sample: 550

RESULTS:

CLASS	DEFECTIVE VISION	
	YES	NO
1 - 2	9.1%	90.9%
3 - 4	16.7%	83.3%
5 - 6	21.8%	78.2%
7 - 8	22.8%	77.2%
9 - 10	23.4%	76.6%
Total	**21.9%**	**78.1%**

Distribution of the students based on classes

INFERENCE: Based on the above sample, 21.9% are having defective vision. Among them, 9.1% are children of 1-2 classes, 16.7% are in 3-4 classes, 21.8% are in 5-6 classes, 22.8% are in 7-8 classes and remaining 23.4% are in 9-10 classes. So, Defective vision is more prevalent in the students in 9-10 classes.

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GENDER	DEFECTIVE VISION	
	YES	NO
MALE	23.4%	76.6%
FEMALE	20.5%	79.5%
Total	**21.9%**	**78.1%**

Distribution of the students based on Gender

INFERENCE: From the above sample, 21.9% are having defective vision. Among them, 23.4% are boys & remaining 20.5% are girls. Defective vision is more prevalent in boys.

STRAIN	DEFECTIVE VISION	
	YES	NO
YES	17.1%	82.9%
NO	60.0%	40.0%
Total	**21.9%**	**78.1%**

Distribution of students based on strain in reading books:

INFERENCE: Based on the above sample, 21.9% are having defective vision, of which 17.1% are having strain in reading books & remaining 60% don't have any strain while reading. So, most of the children with defective vision do not have any strain in reading books.

PARENTS USING GLASSES	DEFECTIVE VISION	
	YES	NO
YES	23.1%	76.9%
NO	21.6%	78.4%
Total	**21.9%**	**78.1%**

Distribution of students based on the parents using of glasses

INFERENCE: Based on the above study, 21.9% are having defective vision. Among them 23.1% of children's parents are using glasses while the remaining 21.6% of children's parents are not using glasses. Defective vision is more common in children with parents using glasses

OUTDOOR GAMES (in minutes)	DEFECTIVE VISION	
	YES	NO
30 – 90	21.0%	79.0%
90 – 180	22.8%	77.2%
>180	30.0%	70.0%
Total	**21.9%**	**78.1%**

Distribution of children based on their physical activities

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INFERENCE: Based on the above sample, 21.9% are having defective vision. Among them 21% play outdoor games for 30-90 mins, 22.8% play for 90-180 mins and the remaining 30% play for ≥180 mins. Most of the Children with defective vision spend more time in outdoor games.

INDOOR GAMES (in minutes)	DEFECTIVE VISION	
	YES	NO
30 – 90	21.9%	78.7%
91 – 180	10.%	90.0%
Total	**21.9%**	**78.1%**

INFERENCE: Based on the above sample, 21.9% are having defective vision. Among them, 21.9% play indoor games for 30-90 mins & remaining 10% play for 91-180 mins. So most of the children with defective vision are spending less time in indoor games.

TIME SPENT FOR T.V (in minutes)	DEFECTIVE VISION	
	YES	NO
30 – 90	18.8%	81.2%
90 – 180	21.2%	78.8%
>180	37.7%	62.3%
Total	**21.9%**	**78.1%**

Distribution of students based on time spent for watching TV/playing video games/mobile games

INFERENCE: Based on the sample, 21.9% are having defective vision, among them 18.8% spend 30-90mins in watching tv, 21.2% spend 90-180 mins & remaining 37.7% spend ≥180 mins in watching tv. So, defective vision is more common in children who spend ≥180 mins in watching T.V.

TIME SPENT FOR VIDEO GAMES/ MOBILEGAMES (in minutes)	DEFECTIVE VISION	
	YES	NO
30 – 90	21.2%	78.8%
90 – 180	41.7%	58.3%
>180	50.0%	50.0%
Total	**21.9%**	**78.1%**

INFERENCE: Based on the above sample, 21.9% are having defective vision, among them 21.2% are spending 30-90 mins for video/mobile games, 41.7% are spending 90-180 mins & remaining 50% are spending ≥180 mins. So defective vision is more common in children who spend ≥180 mins for mobile/video games.

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CARROT INTAKE	DEFECTIVE VISION	
	YES	NO
DAILY	21.4%	78.6%
WEEKLYONCE	15.9%	84.1%
WEEKLY TWICE	20.2%	79.8%
MONTHLY ONCE	27.1%	72.9%
MONTHLY TWICE	23.8%	76.2%
NOT AT ALL	26.4%	73.6%
Total	**21.9%**	**78.1%**

Distribution of students based on dietary food habits

INFERENCE: Based on the above sample, 21.9% are having defective vision, among them 21.4% eat carrot daily, 15.9% eat weekly one, 20.2% eat weekly twice, 27.1% eat monthly once, 23.8% eat monthly twice, 26.4% do not eat carrot at all. So defective vision is more prevalent in children eating carrot once in a month.

GREEN LEAF VEGETABLES INTAKE	DEFECTIVE VISION	
	YES	NO
DAILY	6.7%	93.3%
WEEKLY ONCE	21.0%	79.0%
WEEKLY TWICE	21.9%	78.1%
MONTHLY ONCE	13.6%	86.4%
MONTHLY TWICE	27.3%	72.7%
NOT AT ALL	33.3%	66.7%
Total	**21.9%**	**78.1%**

INFERENCE: Based on the above sample, 21.9% are having defective vision, among them 6.7% eat green leafy vegetables daily, 21% eat weekly once, 21.9% eat weekly twice, 13.6% eat monthly once, 27.3% eat monthly twice, 33.3% do not eat at all. So, defective vision is more common in children who do not eat green leafy vegetables at all.

FRUITS INTAKE	DEFECTIVE VISION	
	YES	NO
DAILY	19.9%	80.1%
WEEKLYONCE	24.9%	75.1%
WEEKLY TWICE	21.3%	78.7%
MONTHLY ONCE	20.0%	80.0%
MONTHLYTWICE	6.7%	93.3%
NOTATAALL	50.0%	50.0%
Total	**21.9%**	**78.1%**

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INFERENCE: Based on the above sample, 21.9% are having defective vision. Among them 19.9% eat fruits daily, 24.9% eat weekly once, 21.3% eat weekly twice, 20% eat monthly once, 6.7% eat monthly twice and remaining 50% do not eat fruits at all. So, defective vision is more common in children who do not eat fruits at all.

MILK INTAKE	DEFECTIVE VISION	
	YES	NO
DAILY	21.3%	78.7%
OCASSIONLY	20.2%	79.8%
NOTATALL	25.0%	75.0%
Total	**21.9%**	**78.1%**

INFERENCE: Based on the above sample, 21.9% are having defective vision. Among them 21.3% drink milk daily, 20.2% drink occasionally & remaining 25% do not drink milk at all. Defective vision is more common in children who do not drink milk at all.

Diet	DEFECTIVE VISION	
	YES	NO
VEG	34.3%	65.7%
NONVEG	21.1%	78.9%
Total	**21.9%**	**78.1%**

INFERENCE: Based on the above sample, 21.9% are having defective vision. Among them, 34.3% are vegetarians and remaining 21.1% are non-vegetarians. Defective vision is more common in vegetarian diet children.

Black board vision	DEFECTIVE VISION	
	YES	NO
YES	18.0%	82.0%
NO	53.3%	46.7%
Total	**21.9%**	**78.1%**

Distribution of students based on blackboard vision

INFERENCE: Based on the above sample, 21.9% are having defective vision. Among them 18% children have good blackboard vision, and the remaining 53.3% children have difficulty in seeing blackboard. Defective vision is more common in children having difficulty in seeing blackboard.

CONCLUSIONS: Based on the study on refractive errors in school children at Veleru and Veeravalli schools, the following observations were noted:

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From the sample, 21.9% are found to have refractive errors:

Among them, 9.1% are children of 1-2 classes, 16.7% are in 3-4 classes, 21.8% are in 5-6 classes, 22.8% are in 7-8 classes and remaining 23.4% are in 9-10 classes. So, Defective vision is more prevalent in the students in 9-10 classes.

Among the students with defective vision, 23.4% are boys & remaining 20.5% are girls. Defective vision is more prevalent in boys.

Among them, 17.1% are having strain in reading books & remaining 60% don't have any strain while reading. Most of the children with Defective vision do not have any strain in reading books.

23.1% of children's parents are using glasses while the remaining 21.6% of children's parents are not using glasses. Defective vision is more common in children with parents using glasses

21% play outdoor games for 30-90 mins, 22.8% play for 90-180 mins & remaining 30% play for ≥180 mins. Most of the Children with defective vision spend more time in outdoor games.

21.9% play indoor games for 30-90 mins & remaining 10% play for 91-180 mins. Most of the Children with defective vision are spending less time in indoor games,

18.8% spend 30-90mins in watching TV, 21.2% spend 90-180 mins & remaining 37.7% spend ≥180 mins in watching TV. Defective vision is more prevalent in children who spend ≥180 mins in watching TV.

21.2% are spending 30-90 mins for video/mobile games, 41.7% are spending 90-180 mins & remaining 50% are spending ≥180 mins. Defective vision is more common in children who spend ≥180 mins for mobile/video games.

21.4% eat carrot daily, 15.9% eat weekly one, 20.2% eat weekly twice, 27.1% eat monthly once, 23.8% eat monthly twice, 26.4% do not eat carrot at all. Defective vision is more prevalent in children eating carrot once in a month.

6.7% eat green leafy vegetables daily, 21% eat weekly once, 21.9% eat weekly twice, 13.6% eat monthly once, 27.3% eat monthly twice, 33.3% do not eat at all. Defective vision is more common in children who do not eat green leafy vegetables at all.

19.9% eat fruits daily, 24.9% eat weekly once, 21.3% eat weekly twice, 20% eat monthly once, 6.7% eat monthly twice and remaining 50% do not eat fruits at all. Defective vision is more common in children who do not eat fruits at all.

21.3% drink milk daily, 20.2% drink occasionally & remaining 25% do not drink milk at all. Defective vision is more common in children who do not drink milk at all.

34.3% are vegetarians and remaining 21.1% are non-vegetarians. Defective vision is more common in vegetarian diet children.

18% children have good blackboard vision and the remaining 53.3% children have difficulty in seeing blackboard. Defective vision is more common in children having difficulty in seeing blackboard.

RECOMMENDATIONS:

- All the students who are examined have been explained the importance of eating green leafy vegetables and most importantly the benefits of eating carrots in preventing vision problems.
- Ill effects of watching T. V for a long time have been explained.
- The importance of eye check- up once in a year has specially mentioned.

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- Students who complain of head ache and watering of eye without any vision defect are also advised to consult an ophthalmologist immediately.
- Teachers are advised to observe children who find difficulty in sitting back benches.
- Students have been educated to inform their parents or teachers if any eye complaints arise.
- Children who are not wearing spectacles in spite of their refractive errors have been explained about future problems due to their negligence.
- All the children are educated about bit to spots that occur in the eyes due to vitamin deficiency.

REFERENCES

1. Prevalence of refractive error in school children of Karachi. Prevalence of refractive error in school children of Karachi. J Pak Med Assoc. 2008; 58: 322–325. [PubMed].
2. Zylbermann R, Landau D, Berson D. The influence of study habits on myopia in Jewish teenagers. J Pediatr Ophthalmol Strabismus. 1993; 30: 319–322. [PubMed].
3. Khurana AK. Text book of ophthalmology. 3rded. New Delhi: New Age International Publisher; 2006: 52-59.
4. World Health Organization. Global initiative for the elimination of avoidable blindness. Programme for the Prevention of Blindness and Deafness. Geneva: WHO, 1997.
5. Sethi S, Kartha GP. Prevalence of refractive errors among school children (12-17years) of Ahmedabad city. Ind Journal of Com Med. 2000; 25: 181-83.

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