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A STUDY TO ASSESS THE FACTORS ASSOCIATED WITH REFRACTIVE ERROR AMONG SCHOOL CHILDREN WEARING SPECTACLES AT SELECTED HIGH SCHOOL

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ABSTRACT

Introduction: Refractive error is a one of the most common problem among children which may lead to blindness.Refractive errors cannot be prevented, but they can be diagnosed early by a routine eye examination and treated with corrective glasses, contact lenses or refractive surgery.

Objective:To determine the factors associated with refractive error among school children and to associate the selected demographic variables with factors associated with refractive error among school children.

Material and method: The research design adopted for this study was non-experimental descriptive study. The study was conducted at selected school with 30 samples. The samples who met the inclusion criteria were selected by using convenient sampling technique. The tool used for the study was demographic variable and checklist to assess the factors associated with refractive error.

Result: Out 30 samples, 18(60%) of the children have the refractive error due to heredity; 3(10%) of the children are found the refractive error with malnourished; 6 (23%) of the children have limited outdoor activity, watching TV, using computer and palsyng videogames which constituted refractive error and 2(7%) for the children with refractive error due to reading books in dim light.

Conclusion: Refractive error needs careful evaluation and preventive care for children which leads to impaired quality of life and interfere with their daily lifestyle. Assessing the risk factor will help us to prevent and control the problem of refractive error in future generation which is helpful for the students to live a life problem free life.

Key Words: Refractive error, Spectacles, School children, Myopia



1. INTRODUCTION

Eye is a compact organ of sense of sight. Sight is an important indicator of health and quality of life. Eye is the most precious human organ for the function of vision, expression and beauty. Eighty-five per cent of the information received from the environment is visual (Harley, 2007). Vision is an integral part of effective communication and learning. Good vision is an important part of education. Many experts believe 80% of learning is done through a child's eyes. A child's eyes are always use in the classroom for Reading, computer usage and chalkboard work. Therefore, education has increased visual requirements especially in children's which disturbs their vision, when a child's vision is not clear it affects mobility, learning, classroom participation and restrict access to information.

Normally, the lens focuses light rays directly on the retina, resulting in clear vision; this is called as refraction. Any abnormalities in refraction cause refractive errors. Refractive error is a state in which optical system of the eye fails to adjust to bring parallel rays of light to focus on proper place (fovea). It is a very common eye disorder. It occurs when the eye cannot clearly focus the images from the outside world. Refractive error could be considered as an avoidable condition among various conditions leading to visual disabilities in children. The result of refractive errors is blurred vision, which is sometimes so severe that it causes visual impairment.

The three most common refractive errors are:

- Myopia (near sightedness): Difficulty in seeing distant objects clearly
- Hyperopia (far sightedness): Difficulty in seeing close objects clearly
- Astigmatism: Distorted vision resulting from an irregularly curved cornea, the clear covering of the eyeball.

Childhood visual impairment due to refractive errors is one of the most common problems among school-age children and is the second leading cause for treatable blindness (Lian-Hong et al., 2010). Refractive errors affected approximately more than half of the students between the 7 to 15 years in Qavin-Iran (Khalaj et al., 2009). The onset of refractory errors or worsening of previous errors peaks in adolescence as a result of the growth spurt. The potential risk factors for myopia were family history, near work and time spent outdoors.

Most refractive error can be managed by early refractive correction. If it cannot treated in childhood may come up with amblyopia, resulting in blindness. Refractive errors cannot be prevented, but they can be diagnosed early by a routine eye examination and treated with corrective glasses, contact lenses or refractive surgery. The most commonly used correction method is spectacles

The World Health Organization and a coalition of non-government organization has launched a global initiative; Vision 2020: The Right to Sight (Pizzarello et al., 2004), one of its priorities is correction of refractive errors and low vision to eliminate avoidable visual impairment and blindness on a global scale (Pararajasegaram, 1999). It is estimated that Worldwide, there are about 2.3 billion people have refractive error. Out of these peoples, only 1.8 billion have access to eye health care services which are affordable correction. The prevalence of myopia is less than 2% before 7 or 8 years but increases with age and reaches 20% at 15 year.

In the United States the prevalence of blindness and serious visual impairment in paediatric population is estimated at 30 to 64 children per 100,000 populations. Another 400 children per 100,000 have less serious impairment. About 13% of Indian population is in the age group of 10-15 years. And about 20% of children develop refractive error by the age of 16 years. In India 6-7% of children in the age group of 10-15 years have refractive errors affecting their learning at school. In 2011, the Mashhad Eye Study showed that the prevalence of myopia and hyperopia in individuals >15 years is 22.36% (95%CI: 20.06-24.66) and 34.21% (95%CI: 31.57-36.85), respectively. The prevalence of astigmatism was 25.64% (95%CI: 23.76-27.51). In Egypt there are few studies showing the prevalence of errors of refraction. A survey conducted among 5839 Egyptian schoolchildren aged 7-15 years found that the prevalence of refractive errors (visual acuity \leq 6/12) was 22.1% (El-Bayoumy et al., 2007)

Jeddiblouzan, L et.al.,(2007) A cross-sectional was conducted study to compare the prevalence and risk factors for myopia in 6and 7year old children of Chinese ethnicity in Sydney and Singapore. 124 children from the Sydney Myopia Study and 628 from the Singapore Cohort Study on the Risk Factors for Myopia were the study samples. The prevalence of myopia in children of Chinese ethnicity was significantly lower in Sydney (3.3%) than in Singapore (29.1%). Prevalence of myopia in 1 or more parents was 68% in Sydney and 71% in Singapore. Children in Sydney read more



books per week and did more near work activity. Children in Sydney spent more time on outdoor which was the most significant factor associated with the differences in the prevalence of myopia between the 2 sites. The lower prevalence of myopia in Sydney was associated with increased hours of outdoor activities. The study hypothesizes that another factor contributing to the differences in the prevalence of myopia may be the early educational pressures found in Singapore but not in Sydney.

Amruta.S.Padhey et al.,(2009) had conducted a study on prevalence of uncorrected refractive error and other eye problems among urban and rural school children's. They examined 5,021 children of 8 urban clusters and 7,401 children of 28 rural clusters. The cluster-weighted prevalence of uncorrected refractive error in urban and rural children was 5.46% (95% CI, 5.44-5.48) and 2.63% (95% CI, 2.62-2.64), respectively. The prevalence of myopia, hypermetropia and astigmatism in urban children was 3.16%, 1.06% and 0.16%, respectively. In rural children, the prevalence of myopia, hypermetropia and astigmatism was 1.45%, 0.39% and 0.21%, respectively. The prevalence of amblyopia was 0.8% in urban and 0.2% in rural children. Thirteen to 15 years old children attending urban schools were most likely to have uncorrected myopia.

N.Prema (2011) had conducted a study on causing factors of refractive error in children: heredity or environment? A total of 123(VII STD) students aged between 12 and 13 were screened with the help of an Optometrist in the classroom. Forty-six (37.39%) of them were found to be having the problem of Refractive Error. Detailed information regarding their parental Refractive status, near work (watching TV, working on the computers, playing video games and reading books for pleasure etc) and outdoor activities (Time spent on outdoor games and other activities) per day were collected carefully and subjected to association analysis. In a total of 123 students examined, of them 46 (37.39%) were suffering from refractive error.

TsegawAyanaw et al.,(2012) had conducted a study on Prevalence of Refractive Errors Among School Children in Gondar Town at Northwest Ethiopia. This was a cross-sectional study of 1852 students in 8 elementary schools. Subjects were selected by multistage random sampling. Result of the study cohort was comprised of 45.8% males and 54.2% females from 8 randomly selected elementary schools with a response rate of 93%. Refractive errors in either eye were present in 174 (9.4%) children. Of these, myopia was diagnosed in 55 (31.6%) children in the right and left eyes followed by hyperopia in 46 (26.4%) and 39 (22.4%) in the right and left eyes respectively.

SintayehuAwekeSewunet et al.,(2014) had conducted a study on uncorrected refractive error and associated factors among primary school children's in DebreMarkos district at northwest Ethiopia. A cross section study design was employed. Four hundred thirty two students were randomly selected using a multistage stratified sampling technique. The data were collected by trained ophthalmic nurses through interview, structured questionnaires and physical examinations. Snellen's visual acuity measurement chart was used to identify the visual acuity of students. Students with visual acuity less than 6/12 had undergone further examination using auto refractor and cross-checked using spherical and cylindrical lenses. Result reveals that Out of 432 students selected for the study, 420 (97.2%) were in the age group 7–15 years. The mean age was 12 ± 2.1 SD. Overall prevalence of refractive error was 43 (10.2%). Myopia was found among the most dominant 5.47% followed by astigmatism 1.9% and hyperopia 1.4% in both sexes. Female sex (AOR: 3.96, 95% CI: 1.55-10.09), higher grade level (AOR: 4.82, 95% CI: 1.98-11.47) and using computers regularly (AOR: 4.53, 95% CI: 1.58-12.96) were significantly associated with refractive error.

Asmaa G. Mohamed et al,(2014) had conducted a study on Refractive Errors among Primary Schools Children in Assiut District at Egypt. Descriptive cross sectional study design was used. The students of primary schools in the first, second and third grades under ten years old were the focus of the study and they were selected by stratified random sampling technique. The calculated sample size was 196. Result was 241 students (107 males and 134 females) participated in the study but 142 only agreed to perform eye examination with 59% response rate. Ninety-five children (66.9%) had a significant refractive error of ± 0.50 or worse in one or both eyes.

By assessing the factors associated with refractive errors among school children can identify the cause for the refractive error and prevent the visual problems by promoting the knowledge on care of the eye. In order to reduce the occurrence of avoidable visual impairment and blindness caused by refractive errors, there is an urgent need for obtaining the epidemiological information on refractive errors and other eye diseases among school-age children. In addition, during



clinical experience the investigator had exposure to most of the children's with near sightedness and long sightedness. They have complained about difficulty in reading, head ache, dizziness. The investigator felt there is a need to assess the factors associated with refractive error which helps to prevent the eye disorders to the school children.

2. OBJECTIVES

- To determine the factors associated with refractive error among school children
- To associate the selected demographic variables with factors associated with refractive error among school children.

3. METHODS AND MATERIALS USED

The research design adopted for this study was non-experimental descriptive study. The study was conducted at selected school with 30 samples. The samples who met the inclusion criteria were selected by using convenient sampling technique. The tool used for the study was demographic variable and checklist to assess the factors associated with refractive error. Data was analyzed by using descriptive and inferential statistics.

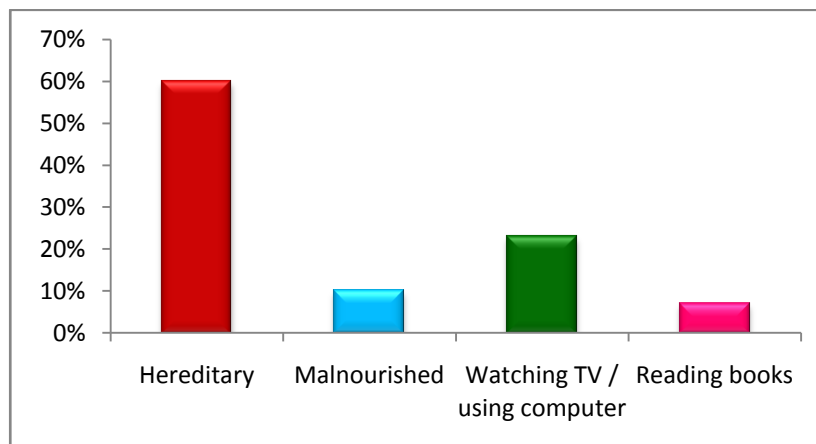
Data Collection Procedure

The formal Permission was obtained from the Headmaster from the selected school. After selecting the sample the investigator introduced him to the children and developed a good rapport and also explained the purpose of the study. Demographic data and the factors associated with refractive error was collected by using interview technique.

4. RESULTS

The number and percentage distribution of demographic variables of the children as follows

Demographic variables	No	Percentage
1. Age		
a) 6-10 years	0	-
b) 11-13 years	30	100%
2. Sex		
a) Male	22	73.3%
b) Female	8	26.6%
3. Education		
a) 3 rd – 5 th	0	-
b) 6 th – 8 th	30	100%
4. Socio economic		
a) Low class	13	43.3%
b) Middle class	17	56.6%
5. Residency		
a) Urban	0	-
b) Rural	30	100%
6. Type of food		
a) Vegetarian	5	16.6%
b) Non- vegetarian	25	83%



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There is no significant association between the demographic variables and factors associated with refractive error

5. RECOMMENDATIONS

- This study can be done in using large sample size
- Same study can be done in different settings such as community area
- Comparative and combine studies can be conducted on other essential eye problems.
- Comparative study can be done between rural and urban children

6. CONCLUSION

Refractive error needs careful evaluation and preventive care for children which leads to impaired quality of life and interfere with their daily lifestyle. Assessing the risk factor will help us to prevent and control the problem of refractive error in future generation which is helpful for the students to live a life problem free life.

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