

Prevalence of Refractive Error in Government Primary School Children of Shaheed Benazirabad

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ABSTRACT

Objectives: To determine the prevalence for errors of refraction in children of primary school.

Methods: This cross-sectional study was conducted in 137 government schools of district shaheed benazirabad sindh Pakistan from December 2016 to January 2017. Approximately 9500 enrolled children were screened from 139 government schools of district Shaheed Benazirabad for refractive error via history questions and 220 detected children were screened by visual acuity. The collected was analyzed statistically and the results were tabulated.

Result: In this study 9.5% of history positive children were having refractive error on visual acuity, 3.6% having congenital anomaly 1.4% having night blindness and 1.4% were having trauma.

Conclusion: Our study concludes that prevalence of refractive errors among school children is rapidly increasing. It is an unrecognized cause for poor performance at schools.

Key Word: Refractive Error, Primary School, Children, Prevalence, Shaheed Benazirabad.

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INTRODUCTION:

Errors of refraction are optical defects of the eye in which, the light is not focused at a single point on the retina resulting in compromise of the normal vision. Refractive error is very important factor in decreased vision which is an important factor for morbidity in the children worldwide¹. The children do not usually complain about the vision problems, early recognition and solution of eye problem are important to protect from severe and untreatable vision morbidities which could affect their performance and adjustment in school².

Vision deficit at early age due to refractive errors is among the commonest difficulties among school children and ranks as second leading cause of preventable blindness. Undetected or under corrected refractive errors, particularly

nearsigh-tedness, comprise many problems among school children in this condition the child cannot see far objects properly and is unable to read from the blackboard, which seriously affects a child's participating and learning abilities in the class and thus on the child's education, career, and socioeconomic status³. In majority of cases, vision problems in children are easily detected by simple tests (such as visual acuity screening) and can be corrected by properly fitted quality eye glasses at appropriate time. Due to lack of appropriate optical correction, a big number of children loses educational opportunities⁴.

Unfortunately, studies in developing countries state that 35-85% subjects of refractive errors dont use optical corrections and a big number of them have never been screened or examined. Among developed countries like Baltimore, Kazuhiro Japan and santa monica USA the refractive error burden has been reported at 8.2%, 10.4% and 18.2% respectively⁵. Early detection of vision problems can be beneficial in regards of education, behavior and life quality. Correction of refractory errors and low vision is one of the priorities of global initiatives for vision 2020⁶.

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In general, refractive errors can be easily corrected by the use of glasses. The main risk factor for refractive errors is social changes such as increase in near-intensive work, reading, and writing, and working on a computer².

Vision screening is aimed to find out the undetected eye problems by using rapidly applied procedures in apparently healthy subjects. The screening is not aimed to diagnose any disease; it is just an initial examination. Subjects with positive test results are referred to concerned specialists for diagnostic work-up and treatment. Children having severe learning and behavioural problems only are often brought to eye care personnel for evaluation. There are no national preschool/school screening services for visual disorders in Ethiopia⁷.

Visual deficit due to error of refraction is described as visual acuity less than 6/18 in the good eye. Error of refraction cause blindness at an early age and the number of blind-person-years due to error of refraction in developing countries is approximately twice as high as cataract related blindness. Personal, social and cultural factors have important role to an inability to visit eye care personnels result in serious outcomes⁷.

Refractive errors affect a large number of world's population, regardless of sex, age and ethnic group. Refractive errors are diagnosed with ease, measured and corrected with spectacles or other methods, resulting in normal vision. If uncorrected or improperly corrected, refractive errors are becoming a major cause of visual impairment and even blindness. The estimate of visual problems due to uncorrected refractive errors is a public health concern. It is reported that more than 12 million children in the age group 5-15 years are visually impaired due to uncorrected or inadequately corrected refractive errors⁸.

Refractive errors can cause a heavy financial burden on the society. School children are considered a high risk group because uncorrected refractive errors can negatively affect their learning abilities and their mental and physical health².

To address the issue of visual impairment in children, the World Health Organization recently launched a global initiative, VISION

2020-The Right to Sight. The correction of refractive error is included in their strategy for the elimination of avoidable visual disability and blindness includes. So, in order to provide an early detection and initiate early treatment, a professional based screening program for all school-aged children is recommended. Recently, a number of surveys have been done among students and elderly subjects in Iran. These studies suggest that the prevalence of hyperopia in Iran is high, so further studies in different parts of the country should be done to determine the role of factors such as race, genetics and even environment⁶. A study conducted in 2010 concluded that the distribution of refractive errors changes from positive skewed to negative skewed as the age of the child increases, 9th year of age being most vulnerable to environmental and intense studies effects⁹.

Satish K, conducted a research in school children in India in 2014 and concluded that the prevalence of refractive error were higher among the children who have more exposure to screens like television, computers and video games¹⁰.

Pavithra et al discovered in their research that the prevalence of hypermetropia was higher among females and younger age group while myopia was more prevalent in older age groups particularly 13 to 15 years of age¹¹.

A study conducted in Ghana concluded that refractive errors are the most common cause of visual impairment among school going children and regular screening are invaluable for the better future of children¹². A study conducted in public school Lahore revealed that around 50% of the school going children with refracted error remain undiagnosed and untreated, which shows the importance of screening in school children¹³. Pradnya et al emphasize on the importance of visual screening in their study among school going children and they suggest the inclusion of vision screening program in school health systems¹⁴. Another study conducted in India suggests that visual screening should be conducted in schools at regular intervals as the decreased vision has a strong impact on a child's performance in studies and extracurricular activities at school and home¹⁵.

METHODS:

This cross-sectional study was carried out on approximately 9500 school children of 150 government schools of district shaheed benazirabad from December 2016 to January 2017. The sampling technique was convenience sampling. Activity team visited each school during school timings and identify the children for visual acuity from class room by some technical history questions that were:

1. *Can all of you are able to see what your teacher write on black/ white board specially who are sitting behind?*
2. *Any one of you feeling difficulty or eye watering while seeing from distance?*
3. *Do you people face any problem while watching Television?*
4. *Does teacher identified any child with vision problem or lack of interest in studies?*

After asking the question children who answered "YES" were carried out from class and examined via visual acuity method. Data was analyzed by frequency and mean percentage.

RESULTS:

A total of 139 schools were included in study with a total of 9500 students, out of which 220 students (2.3%) were identified with eye problems via history, 185 students (84.1%) were identified having some problem related to eyes but their vision was normal, and 35 students (15.9%) found to have decreased vision (Table-1), out of these 21 students (9.5%) were found to have refractive error. congenital disorders were diagnosed in 8 children (3.6%) causing decreased vision, 3 children (1.4%) were suffering from night blindness, 3 students (1.4%) were having decreased vision due to trauma (Table-II).

Table. I. Students Having Eye Problem.

Number of Schools	Total Enrollment	Students identified on history		
		without vision problems	with vision problems	
139	9500	220 (2.3%)	185 (84.1%)	35 (15.9%)

Table. II. Decreased Vision in Students Having Eye Problems (n=220).

Cause of Decreased Vision	Number of Cases	Percentage
Refractive Error	21	9.5
Congenital Disorder	08	3.6
Night Blindness	03	1.4
Eye Trauma	03	1.4
Total	35	15.9

DISCUSSION:

The study was conducted at 139 government schools of Taluka Sakrand and Taluka Daur of District Shaheed Benazirabad. 9500 enrolled students from class 1 to class 5 were interviewed and 220 history positive students were examined for visual acuity.

This study reflects that 2.3% primary school students of district Nawabshah were having eye problems. They were feeling trouble but no one ever asked them and they didn't tell anyone about the restlessness they felt all the time. It may be due to unawareness regarding health and hygiene for eyes and also due to improper bonding between kids and their elders. Amruta et al found in their research that the prevalence of refractive errors among rural school children was about 2.63% which is quite similar to our results¹⁶.

9.5% of primary school children were detected to have myopia, which may be due to improper light at night in rural areas, in schools and due to excessive amount of near vision work. School children and their families both are unaware about the amount and direction of light during study and study environment. Jin Tao Sun et al also support it in their research, which shows that the prevalence of myopia increases as class grade of the children increases, due to excessive near work¹⁷. It alarms to conduct studies among school teachers and parents to plan strategies for eye health education program for control of eye problems in young children.

A study in Tehsil Kabul shows that prevalence of congenital eye disorders in Pakistan is up to 53%¹⁸. Maternal consanguinity was detected as most common cause so it can be prevented by preferring non consanguineous marriages¹⁸. In this study 3.8% of examined population identified with congenital anomalies.

Night blindness occurs due to deficiency of vitamin A. Available studies and literature show that night blindness in young school children is associated with Giardiasis which leads to malabsorption and results in vitamin A deficiency. In this study 1.3% of examined children were complaining for night blindness suggestive of

unhygienic living practices and improper and imbalance nutrition. A study conducted in Sudan shows that 2.6% of the school children had night blindness while it was 4.2% among children less than 4 years of age¹⁹. This is twice the result of our study and shows that night blindness in children is associated with malnutrition.

A very hurting reality was also found during study that children were mishandled and beaten by parents and teachers so badly that 1.3% among examined children has lost their eyes due to trauma. Few children had trauma while playing but they were neglected by families resulting in vision loss. A study shows that vision loss due to trauma may be due to direct ocular injury or due to head trauma²⁰. Direct ocular injury may result in anatomical disruption of the eyeball resulting in vision loss, or it may cause injury to optic nerve in an anatomically normal looking eye²⁰. In our study all the children with traumatic vision loss were having anatomically disrupted eyeball. Again there is a need of conducting awareness regarding child protection, child handling and child training among school teachers and parents.

In our research most of the children without any sight problems were found to have none or miscellaneous eye problem which includes VKC, mild bacterial infections and watering due to common cold etc. A study conducted in Bahawalpur shows that the prevalence of VKC was 21.9%²¹ which is quite high. We did our research in winters and VKC symptoms are particularly dominant during summer, so it may be because of the seasonal factor that our results contradict the results of above mentioned study. Most of the children volunteered themselves for the eye checkup and found to have good vision and no disease. According to teachers these children were active in extracurricular activities and use to spend very less time for studies. This interesting finding in our study is supported by the results of a study conducted in Singapore, which shows that prevalence of myopia was significantly less in physically active children and it is an independent factor from near work²².

Our study demonstrates that environmental and social factors play crucial role in causing eye

disorders among young school children. Primary school children have high prevalence of myopia that is 9.3% just because of improper lighting in schools, no light at night in rural areas and unawareness regarding reading rules.

There were many limitations in our study. Research was interrupted due to winter vacations in school and attendance was short in some schools due to which children couldn't be covered properly. Also we didn't have proper separate checkup rooms.

CONCLUSION:

Our study concludes that prevalence of refractive errors among school children is rapidly increasing. It is an unrecognized cause for poor performance at schools. School health care systems must include regular eye checkups including vision analysis and other miscellaneous eye problems to secure a better future of the children, which as a result will improve the country's educational and economical status.

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