

Screening of Common Eye Problems in Children by School Teachers and Community Health Workers

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Purpose: To detect the refractive error, amblyopia, trachoma and squint in the school and non-school going children between the age of 3 to 16 years.

Design: Cross sectional study.

Place and Duration of Study: DHQ Hospital Vehari and duration of study was one year, March 2015 till Feb 2016.

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Material and Methods: There were 33 villages of District Vehari selected for this study. In the pilot phase, three villages were recruited. Two primary schools (one female and one male) from each village were included. One teacher from each school, one community health worker and one community-based organization Members were trained to detect visual deficit, squint, and red eye. Eye examination kit consisting of vision chart, three-meter rope, first aid material for eye, was provided. The screening was carried out at the community and the affected children were referred for further examination to DHQ Hospital Vehari.

Results: A total of 11086 (88.3%) children with age range from 3 years to 16 years (mean 9.5 years) were screened by the teachers and the community health workers. Out of these screened children brought to our hospital 90% had positive findings like, refractive error, squint, amblyopia, trachoma and other ocular abnormalities.

Conclusion: Primary school teachers and the community-based organizations are very helpful in recognizing and solving the eye problems in younger age groups in remote areas.

Key Words: CCEHP (Community Children Eye Health Program), Refractive error, School Eye Health.

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Vision plays an important role in development of physiological and intellectual development in the life of a child. Visual impairment in children is a worldwide problem and one of the major causes of significant morbidity. Many of the causes are either preventable or treatable. It is estimated that globally there are 1.5 million children who are blind, and among these one million live in Asia, 0.3 million live in Africa, 0.1 million in Latin America and 0.1 million live in the rest of the world. Avoidable blindness amongst these is 39 – 72% while 9 – 58% is

preventable and 14 – 31% is treatable. Children with visual impairment need urgent attention as a delay can cause amblyopia¹. Prevalence of childhood blindness varies from 1.2/1000 in poor countries to 0.3/1000 in affluent countries of the world. It is also estimated that 8 new children are added per 100,000 children each year in developed countries and this number might be higher in underdeveloped countries². The available data suggest that there may be a tenfold difference in prevalence between the wealthiest countries of the world and the poorest,

ranging from as low as 0.1/1000 children aged 0 – 15 years in the wealthiest countries to 1.1/1000 children in the poorest³. Actual number of blind children are much smaller than the number of adults blind, e.g., from cataract but the number of years lived with blindness by blind children is almost the same as the total number of “blind years” due to age-related cataract. This high number of blind years due to childhood blindness is one of the reasons why the control of childhood blindness is a priority of the WHO/IAPB Vision 2020, The Right to Sight programme.⁴ Often the children don't complain of their poor vision and adjust themselves according to the circumstances, sit on front desk, squeeze eyes to see black board, bring printed matter close to eyes to read. Sometimes they avoid work which needs concentration and are detained from school due to poor performance. Effective methods of vision screening in school children are useful in detecting correctable causes of decreased vision, like refractive errors and in minimizing long-term visual disability⁵. Eye screening in children is an initial examination which when positive, needs referral to Ophthalmologist for examination and treatment⁶. This will lead to early detection and prompt treatment to prevent morbidity/disability. This will change behavior of child, improve learning capability, adjustment at school and have quality of life benefits⁷. Visual impairment in children is a worldwide problem and refractive error is the major contributor which causes significant morbidity. Dandona et al estimated that 12.3% total blindness was due to uncorrected refractive errors, which is also responsible for a large number of blind years lived by a person than most other causes if left uncorrected⁸. In one study it was estimated that blindness due to refractive errors resulted on an average of 30 years of blindness for each person as compared with 5 years of blindness due to untreated cataract for each person⁹.

MATERIAL AND METHODS

There were 12554 children of 33 communities of District Vehari, between the ages of 3 to 16 years. Out of these children school going were 7978 (63.54%) and non-school going were 4576 (36.45%) of both gender. All these children using or not using glasses were included in the study. Patients of age 17 years and above and all those who did not want to participate were excluded from the study. There were 62 teachers, 26 community health workers (CHWs), 13 community-based organizers (CBOs), 10 care givers of

33 communities trained by the consultant ophthalmologist, one focal person from the partners, 2 technicians, one WMO, one refractionist and one consultant ophthalmologist of secondary care hospital who took part in this study. The duration of this study was one year. MOU was signed between the partners (that is PLAN Pakistan sponsoring partner, RASTI the implementing partner, the education department and the eye department DHQ Hospital Vehari, the working partners), After signing the MOU, Education department provided the list of the teachers of primary schools. One teacher each from boys and girls schools was selected for training. Working plan of these 33 communities was made in four clusters and the teachers, community health workers and the community-based organization member in groups of 25 to 30 were trained at the hospital by the consultant. They were provided with technical knowledge about primary eye care (PEC), with the help of charts and audio visual aids, vision testing, disease detection and referral of affected children on Performa. PEC material kits were given to them which contained examination tools: 1 torch, with 2 batteries, 1 vision screening card (Snellen's test type), 1 instruction card, 1 measurement Rope of 3 meters. First aid material like eye pads & sticking tape, tetracycline eye ointment, primary eye care educational material (1 booklet) containing written material, a bag for keeping all this and a register for record keeping. This study was divided in two phases, a pilot and the phase II. Pilot phase was instituted in three villages. After successful completion of this phase the study was expanded to the phase II. The master trainers examined the children and the technicians helped and supervised them. The affected children with vision less than 6/12 or having squint, ptosis, amblyopia or red eye etc. were referred to the hospital. Those affected children were examined at hospital and found either affected (Refractive error or diseased) or normal. The focal person provided medicines to the children and delivered glasses at the community. After the provision of glasses and medicines the consultant visited the community on prescribed date and randomly checked the children and checked the performance of the students with the glasses and found them very satisfactory.

RESULTS

A total of 11086 (88.3%) children with age range of 3 years to 16 years with mean age of 9.5 years were screened by the teachers and the community health

workers. There were 1468 (11.7%) children who did not participate due to some reason or the other. Table 1 and fig. 1 shows number of patients according to age distribution. In the 3- 5 years age group there were 2700 (24.36%) patients, from 6 to 10 years there were 6515 (58.77%) patients, and from 11 to 16 years there were 1854 (16.87%) patients.

Table 2 and fig. 2 shows the gender distribution of the total screened and affected children. Among these there were 5611 males (51%) and 5475 females (49%). Total of 943 (8.5%) were selected as affected. Of these 457 boys (48%) and 486 girls (52%), were referred to eye department DHQ Hospital Vehari as affected children.

Table 1: Age distribution of patients.

Age in Years	No. of Children	Percentage
3 - 5	2700	24.36
6 - 10	6515	58.77
11 - 16	1871	16.87
Total	11086	100

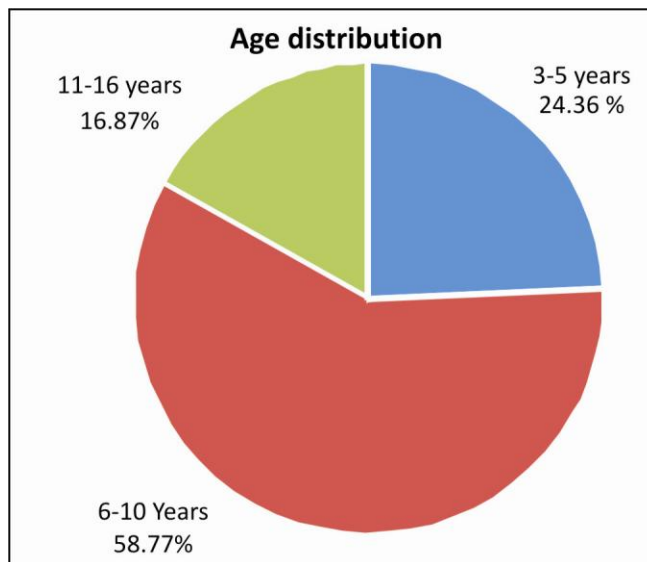


Fig. 1: Age distribution of patients.

The affected children were examined by the consultant ophthalmologist at eye Department and found 97 (10%) normal. The rest of the 846 (90%) were found affected and were given either glasses or

medicines for the disease. Total of 439 (3.95%) were given glasses and 488 (4.40%) were diagnosed as having any disease. In this study we found amblyopia 19 (0.17%), trachoma 124 (1.11%), conjunctivitis 89 (0.80%), squint 19 (0.17%), vernal catarrh 88 (0.79%), blepharitis 13 (0.11%) and other like congenital glaucoma 2 (0.01%), cataract 6 (0.05%), ptosis 4 (0.03%), Bitot spots 6 (0.05%) etc. and other cases were 122 (1.22%) as shown in table 3.

Table 2: Gender Distribution of patients.

Gender Distribution	Boys	Girls	Total
Screened	5611	5475	11086
Affected	457	486	943
True Positive	416	430	846

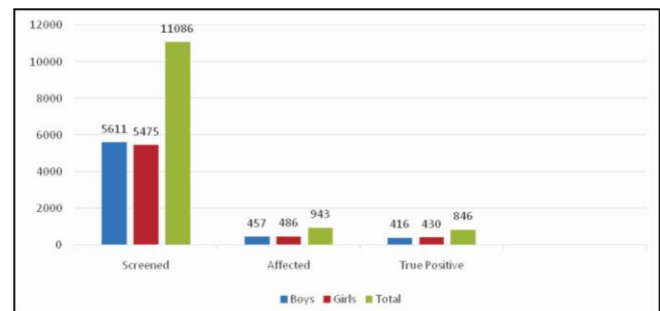


Fig. 2: Gender Distribution.

Table 4 shows the affected children in different clusters. It is seen that the percentage of affected children in each is almost same except Satluj cluster where there are 17.60% affected children. Fig 4 is the bar chart showing the comparison different clusters children screened by the teachers.

The consultant revisited the communities on prescribed date when the children were randomly checked and 94 of the children were found having diseases which either were missed or were using medicines.

The screened children referred to DHQ Hospital were examined by the consultant and it was found that 97 (10%) were normal, which were false negative and those found affected were 846 (90%), true positive. The sensitivity of this screening was calculated to be 90%, and specificity was 99%.

Table 3: Disease distribution of patients.

Diseases	Affected Children	Percentage of Referred	Percentage of Screened
Refractive error	439	49.10	3.9
Vernal catarrh	88	9.33	0.79
Conjunctivitis	89	9.4	0.8
Squint	19	2.12	0.17
Trachoma	124	13.14	1.11
Amblyopia	19	2.12	0.17
Blepharitis	13	1.3	0.11
Others	122	12.9	1.1
Normal	97	10.85	0.87

Table 4: Distribution of patients in different clusters.

	Boys	Girls	Total	Percentage
Sacnjhi Cluster	147	123	270	28.63
Caravan Cluster	92	179	271	28.74
Satlug Cluster	111	55	166	17.60
Chanan Cluster	107	129	236	25.03

Table 5: Table 5 shows the overall picture of the study.

Total	Screened	Males	Females	Referred	Males	Females	Normal	Actual affected	Glasses	Diseased	Revisit
12554	11086	5611	5475	943	457	486	97	846	439	488	94

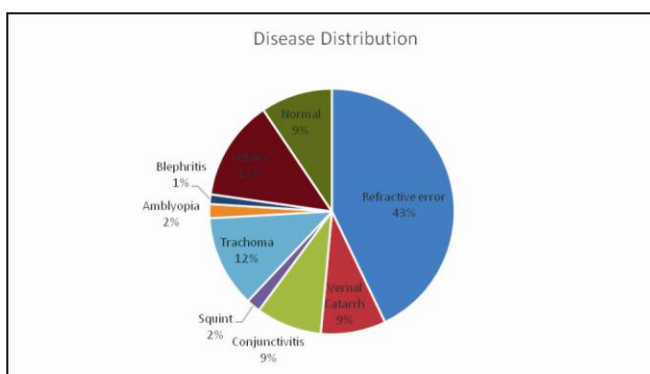


Fig. 3: Disease distribution.

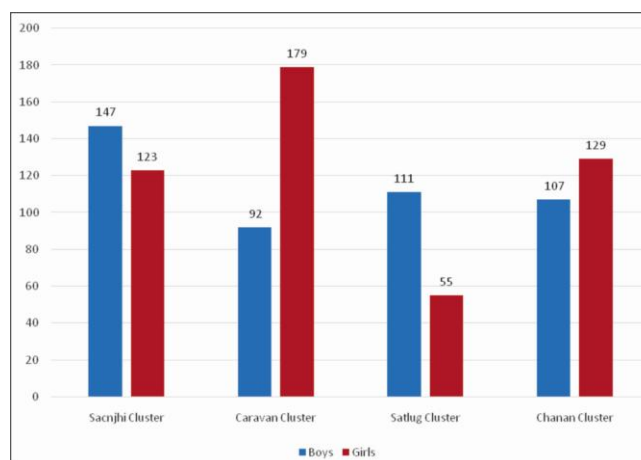


Fig. 4: Distribution according to clusters.

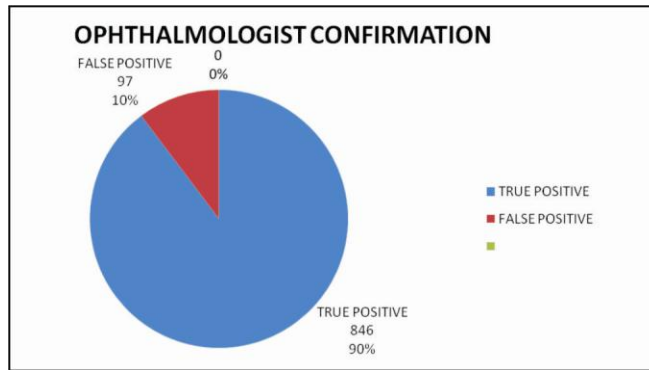


Fig. 5: Sensitivity and specificity of screening.

Table 6:

	Total	Percentage
True Positive	846	90
False Positive	97	10

DISCUSSION

We selected the communities of remote areas for screening the common eye problems by the teachers, community health workers, community-based organization members and care givers as they were of same locality who could approach the children and educate the parents about the refractive error, squint, trachoma, red eye etc. Also, they were much influential and helpful in communication and transportation of children to and from the hospital for checkup and follow-up. The basic knowledge provided to them could be applied for the longer period so that such program could have been made sustainable. Our study was both community and hospital oriented. The screened children labeled as affected were brought to hospital. That is why our results are comparable to any study. We found ocular morbidity of 7.6% which is quite comparable to the reports by Arif and Qamar 8.99%¹⁰ and Haq Nawaz during health screening in primary school children 4.38%¹¹. Khalil reported high prevalence 22.23% in school going children of Distt. Lasbella¹². Haseeb from Karachi reported 10.9% morbidity in school going children ever checked during ophthalmic examination¹³. Shoba Misra noted 14.8% in urban primary school of south India¹⁴, and Wedner SH et al 15.6% in rural area Tanzania¹⁵. We found that amblyopia was 0.17% which is very close to the study by Wedner SH et al: from Tanzania which was 0.2% and strabismus was 0.2%¹⁵.

A female preponderance was noted and we found 52% to be females and 48% males which is contrary to Khyber teaching Hospital and Spenser eye hospital¹⁶. Our study showed that 96% children had normal vision. It might be possible that some children having visual acuity of 6/6, having astigmatism may have been missed. A study by Ugochuchukwu on vision survey in primary school in south eastern Nigeria showed 96.5% vision of 6/9 or better¹⁷.

Refractive error is a significant cause of visual morbidity worldwide.¹⁸ Similarly the most prevalent condition we noted in our study was refractive error 3.9% while WHO studies show its prevalence to be 2 - 10%¹⁵ (which is quite in the range). The study by Sethi et al "Pattern of common eye diseases in children attending outpatient eye department Khyber Teaching Hospital" shows higher value of 12.8%¹⁶ of refractive errors and Uzma Fasih et al found a frequency of 8.11%¹⁹ and 8.9% was found in school children in a study by Haseeb Alam at Hamdard university Karachi²⁰.

The second most common condition was vernal catarrh 63 cases (0.63%) which is a condition quite common in our climate. Sethi et al noted it as 35.6% which is higher as it may be in the patient presenting with the disease to a clinic at the Hospital¹⁶ and Uzma Fasih reported it to be 9.72%¹⁹. However study by Kehinde et al is 4.5% which does not match with our study²¹ and is quite according to weather in Nigeria. This is one of the most common surface disorders in agrarian labor communities and rural living is more prone to chronicity. The symptoms can be controlled/alleviated from potentially blinding complications and absenteeism can be prevented.

Trachoma is the disease of poor countries but now endemic in Australia which is a high income country. Our study revealed a frequency of 1.11% which is quite less in number than a study by Uzma Fasih which is 20% and Qureshi et al which is 48.98%. This may be due to different area of study with poor sanitation. Trachoma is endemic in different parts of Pakistan and it is 96.6% more prevalent in female children²². However, a study noted that less than half the ophthalmologists serving the affected areas were aware of the WHO grading system or the primary health care measures for trachoma²³.

CONCLUSION

Primary school teachers, community health workers and community-based members are very helpful in

screening common eye problems in children at community level.

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Role of Authors

Dr. Ghulam Hussain Asif
Making strategy, planning, implementing, training of teachers, checking the work being done, examining the referred children and visiting the communities. Checking and compiling the data.

Dr Ahla Fatima
Helped in vision testing, disease detection and delivering short lecture to class about "SAFE" for Trachoma.

Dr. Tahir Mehmood Sabir
Helped in doing refractions.

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