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Original Article

EVALUATION OF QOS (QUALITY OF SERVICES) BY LOG FRAME ANALYSIS (LFA) AND OCULAR MORBIDITY IN SCHOOL CHILDREN OF CHANDIGARH

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ABSTRACT

Objective: To evaluate the school vision health program being run by the Chandigarh administration for students, under National Program for Control of Blindness.

- To assess the visual acuity disorders in them.

Methods: The population based cross sectional study was done in fourteen schools of Chandigarh. Chandigarh was divided in four quarters. Sampling frame comprised of Government schools. The eye component of a school health program so run in government schools, by Chandigarh administration was evaluated by LFA. Data analysis was carried out using SPSS13 and Epi Info 2000.

Results: A total of 5404 children were studied, out of which 2801(51.83%) were boys and 2603(48.16%) were girls. Girls in our study showed a higher prevalence of defective visual acuity among girls 322(5.95%). Female preponderance was observed in all age groups.

Evaluation of school health program showed that 51(36%) subjects were of the opinion that all students were examined, 25 (17.86%) told that more than 20% of students were referred to GMCH-32 for further management. All the interviewers agreed that manpower in school health team was adequate.

Conclusion: Low compliance with ocular morbidity was evident as less number of students contacted the eye health physician even after being referred. There is a need to spread awareness pertaining to eye health that can be using local media or by health care workers. More over emphasis has not only to be on therapeutic aspect but prevention too has to be given importance.

Keywords: Log frame analysis, Ocular morbidity.

INTRODUCTION

WHO estimates that 285 million people are visually impaired worldwide. 39 million are blind and 246 million have moderate to severe visual impairment. 146 million people with low-vision are due to uncorrected refractive errors which could be restored with eye glasses. Every five seconds one person in our world goes blind and every one minute one child goes blind [1].

Out of estimated 39 million blind people living worldwide, 15 million blind people lives in India, that means one out of every third blind person in the world lives in India. 2.8 million are blind due to refractive error. In India, 6 million people become blind and low vision every year [2].

Globally 19 million children below age 15 are visually impaired and of these 12 million are due to refractive errors, a condition that could be easily diagnosed and corrected [3]. In India 3.2 million, children are blind under the age of 16 years [2].

The major causes of visual impairment are uncorrected refractive errors (myopia, hyperopia or astigmatism)(43 %), cataract (33%), glaucoma (2%) [3].

Children in the school going age group (6-16yrs) represent 25% of the population in the developing countries. Visual morbidity in school going children needs attention as they constitute a vulnerable group where uncorrected visual problems may have an impact on learning capability and educational potential thus constituting a public health problem.

Hence, simply realising that there's diminution of vision in a child might not be sufficient. The promptness of diagnosis is way more important. The sooner, there's initiation of treatment or corrective measures, the better is the prognosis as far as visual development and overall development of the child is concerned. Thus, implementing screening in the school going age group is a novel idea.

In India, National Programme for Control of Blindness was launched in 1976 as a 100% centrally sponsored scheme with the goal to reduce blindness from 1.4% to 0.3%.[5]

As schools are the best platforms for imparting health education to children and also for any comprehensive health care program, school health program incorporating School children Eye Screening (SES) was initiated under National Program for Control of Blindness (NPCB) in 1994.[6] The components of SES are identification of schools, collection of data regarding students, training of teachers, screening of students by ophthalmic assistants/ophthalmologists, prescription of correcting lens, providing free spectacle to children from poor socioeconomic strata and referring them to higher centre if further management is needed.[7] Any program can be taken up to another level only once we are aware of its success in the formative years of implementation. Hence, the main objective of this study was to evaluate the school vision health program being run by Chandigarh Administration for students, under NPCB and to assess the visual acuity disorders in them.

MATERIALS AND METHODS

Chandigarh is a city and union territory in India that serves as the capital of two states: Haryana and Punjab. The city tops the list of Indian States and Union Territories with the highest per capita income in the country at Rs. 99,262 at current prices and Rs. 70,361 at constant prices (2006-2007). The territory also headed the list of Indian states and territories according to research conducted using 2005 data by Human Development Index.[8] As of 2011 India census, Chandigarh had a population of 960,787, making for a

density of about 7900 persons per square kilometre. Males constitute 55% of the population and females 45%. The sex ratio is 829 females for every 1,000 males – which is the lowest in the country. Chandigarh has an average literacy rate of 86.77%, higher than the national average; with male literacy of 90.81% and female literacy of 81.88%. 10.8% of the population is under 6 years of age. Municipal Corporation runs the administration in the urban area.[9,10] Major religion is Hindu, language spoken are Hindi, Punjabi and English.

The present population based cross sectional study was done in fourteen schools of Chandigarh. Chandigarh was divided in four quarters. Sampling frame included only Government schools. Government schools were only chosen as students of all strata come to these schools unlike private schools where majority of students are from higher strata. Also, the school health program is only run in government schools, which was to be evaluated in this study.

The two stage random sampling was done. In the first stage, 3-4 schools were randomly chosen from each quarter. In the second stage, randomly, one section from each class was chosen and children were examined.

Consent for conducting the study was obtained from the Deputy Director (Education), Chandigarh. The principals of the chosen schools were informed about the study and permission for the visit to the selected schools was sought personally. The principals of the selected schools informed the parents of the students regarding the study and permission was taken through parent teacher link book/school diaries.

A team of ophthalmic technicians, medical social workers, medical officers and helpers was comprised. The team visited the school chosen randomly during the period of Jan 2012-Dec 2012. The study instrument so used was a pre-designed, pre-tested questionnaire. It was used for collecting sociodemographic information and data on visual acuity and spectacle use. It was pretested in a randomly selected school which was not included in the study. Queries from children were asked in Hindi/Punjabi language, while information was filled in English language by the medical social worker. The first part of the questionnaire dealt with information on the sociodemographic profile and second part of the questionnaire included detailed examination of eye for diagnosing ocular morbidity and recording of vitamin A deficiency signs and their ocular manifestations. The WHO clinical staging for trachoma and xerophthalmia was used.[11,12] Vitamin A deficiency was diagnosed if there was history of night blindness or on examination there were signs of conjunctival xerosis, Bitot's spots, corneal xerosis or keratomalacia. Congenital disorders were also looked for like heterochromia iridium, ptosis, irregular pupil, erected upper lacrimal puncta, congenital cataract.

Examinations were performed in the respective school compounds. Due consideration was given to the length of the room, so that it should be longer than 20 feet and also to light, while selecting it. All the children present in the class at the time of the visit were examined in one sitting. Maximum efforts were put to include all the students of the class. Students who were absent on the day of check-up were followed for two more visits and in case of failure to meet them, they were categorized as non-responsive.

Students wearing spectacles were also identified and their vision was checked. The uncorrected/unaided visual acuity of all the students was assessed by Snellen's chart by experienced optometrist to avoid inter-observer variation.

According to the definition used by WHO, visual acuity in the better eye <6/18 was considered as low vision and <20/200 as blindness. A cut-off of <6/9 in either eye was used to define abnormal vision. Children with vision <6/9 in either eye were referred for refraction[12]. These students were motivated to discuss the issue at home and get a written consent from their parents for refraction test. They were referred to Government Medial College and Hospital-32 for refraction. Those who did not undergo refraction were interviewed to assess reasons for non-compliance. Other associated eye disorders were also diagnosed. Follow up of students was done in one fourth of schools.

All the government schools in Chandigarh are being covered under School Health Program, so run by Chandigarh administration. In our study we did evaluation of school health vision program, one of the components of school health program, using log frame for Quality assurance: Refractive error in 5% of students was independently checked again by the second ophthalmic assistant/trained medical officer/trained medical social worker.

Data analysis: After checking the questionnaire for errors the data was entered into a computer database and analyzed using Epi info 2000 statistical software and SPSS 13.

RESULTS

A total of 5404 children were studied, out of which 2801(51.83%) were boys and 2603(48.16%) were girls. Majority of them were Hindus 3347 (60%), followed by Sikhs 1963 (36.3%), 130 (2.4%) Muslims and 64(1.2%) others. The mean age of students was 13.8 years with a range of 8-15 years.

Females had higher prevalence of defective visual acuity 5.95% as compared to 3.5%. Female preponderance was observed in all age groups.

The main reason of decreased of visual acuity was refractive error. Other associated ocular morbidities found were less. Conjunctivitis was found in 24 (fig 1) students (0.44%) followed by stye 10(0.19%) and blephritis 6(0.09%). No case of vitamin A deficiency was observed in our study.

Evaluation of school health program was done using log frame analysis (Table 1). The data was obtained by interviewing teachers and students from each school. Randomly 5 students and 5 teachers were interviewed, from each school. 51 (36.4%) subject told that all the students of schools were examined by school health team of the school health program of UT Chandigarh. Whereas 76 (54.2%) told that around 75-99% students were covered. On being asked how frequently the school was covered, 77(55%) told once in 12 months followed by 38(27%) once in 3 months and 25(18%) once in 6 months. 38 (27%) were of the opinion that around 10-20% of eye diseases other than refraction were diagnosed/treated and 38 (27%), were not aware of this. On being asked about the percentage of children referred, 25 (17.86%) told that more than 20% of students are referred to GMCH-32 for further management.

All the interviewers agreed that manpower in school health team was adequate. 130(92.86%) answered that there was no dark room/any other room present for suitable vision and only 10(7.14%) told that there was dark room present. Regarding health education, 63.57% told that it was done and 62.85% were of opinion that it did change the attitude of students. More than half of them (54.28%) told that health education was given in Hindi language. It was found that all the students who needed spectacle were prescribed.

DISCUSSION

Refractive error is a common eye disorder that results in blurred vision. Uncorrected refractive errors are the most common cause of vision impairment worldwide and the second most common cause of blindness. Improving people's vision could generate considerable economic benefits especially in low and middle-income countries, where these problems are to large extent not corrected and could make a major contribution to global development. Children and adults with uncorrected refractive error face many healths, economic and social problems, including poor vision, reduced education, employment opportunities and social isolation.[12]

Many ocular diseases have their origin in childhood and the morbidity may go unnoticed. It adversely affects the child's performance in school and may also cause severe ocular disability in the later part of life.[13] Visual disability in childhood can be minimised/prevented, if the causes are detected early and treated before they become irreversible.[14]

The prevalence of ocular morbidity in our study was 10.46% among school children from 3rd to 9th standard (8-15yr). Similar results were evident in study done by Nepal et al (11%)[15]. In contrast, high prevalence of ocular morbidity was reported by Gupta et al.[16] This could be ascribed to different age groups and higher prevalence of trachoma, conjunctivitis and vitamin-A deficiency in the population in above mentioned. Uncorrected refractive error is reported as the main cause of visual impairment in school children in India and in other parts of the world.[12,13,16-23] The present study revealed an overall prevalence of visual acuity of 6/9 or worse in 9.46% students, which is comparable to other India based studies[13].

Table 1: Log Frame Matrix For Evaluation Of Eye Component Of School Health Program

Goal/Objective	Objective variable indicator (OVI)	Means of verification (MOV)
Overall Goal Evaluation of Eye Health Services of school Health Program	1. No. Of children in that school diagnosed for refractive error /total children examined	1. interviewing teachers and students
Output 1(Health Component) **Objective:** 1. To find out the refractive error in school Children 2. To find out the ocular morbidity other than refractive error	2. No of children diagnosed with ocular morbidity other than refractive error /total children examined	2. Checking school health card of students
Output 2 (Operational Component) **Objective:** 1. To find out the frequency of eye health examination 2. To assess the adequacy of manpower in eye health team	1. School covered / year -School covered / 6m -School covered / 4 m 2. No. of members in the team and their role / No. of required members	1. Interviewing teachers /students 2. From school health records
Output 3 (Structural Component) **Objective:** 1. To find out if dark room or any other room is present in school for eye examination	1. Dark room or any other room present in school suitable for eye testing	1. Survey of school 2. Interviewing the school health Incharge
Output 4 (Educational Component) **Objective** 1. To assess the awareness about eye health/ diseases	1. No. of lectures or talk given on eye care to students 2. Distribution of any educational material	1. Reviewing the educational material, if any 2. Interviewing teachers/students 3. Checking the school health record
Output 5(Management Component) **Objective** 1. To find out the management of children diagnosed with refractive error or other ocular morbidities	1. No. of children referred for refractive error/total children examined 2. No. of children given spectacles/No. of children diagnosed with refractive error 3. No. of children treated with medicines or prescribed medicines/Total children diagnosed with other ocular morbidities	1. Checking the school health record 2. Checking the school health cards of children

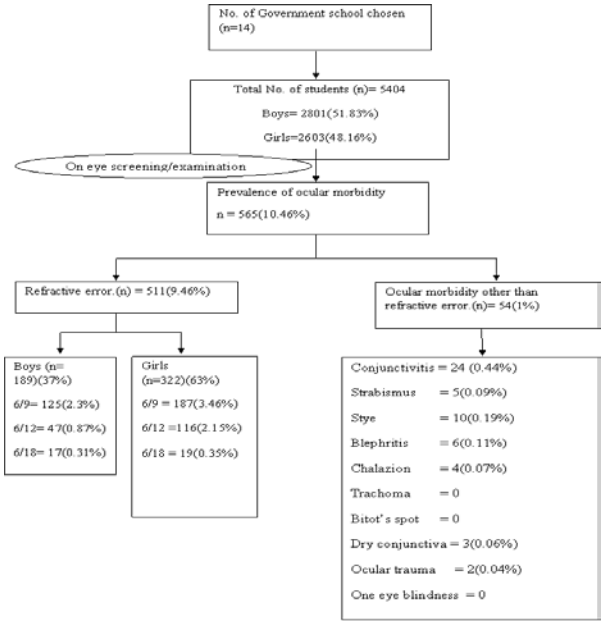

Fig. 1:

In our study visual acuity of 6/12(20/40) or worse was found in 3.7% students, similar results were evident in study done by Dandona et al (2.7%)[24]. And by Padhye et al (3.16%) [25]. Higher prevalence was reported by Uzma et al 9.8%[26]. And GVS Murthy, 7.4% [19]. The prevalence of conjunctivitis in our study was 0.44% comparable to study done by Gupta et al (0.88%)[16]. In contrast higher prevalence of conjunctivitis was reported in other studies done by Jayant et al (2.57%)[13]. and Kumar et al (4.6%)[27]. Varied prevalence can be because of the short duration of illness, seasonal variation, personal hygiene and sociodemographic factors. Low prevalence of strabismus was evident in our study (0.09%). High prevalence was cited in study done by Gupta et al (2.5%).[16] Less number of cases of strabismus in our study were may be due to less number cases with visual acuity 6/18 or worse.

None case of vitamin-A deficiency was observed in our study may be owing to better coverage of children by vitamin-A prophylaxis. These results are similar to that of Reddy and Hassan [14]. The prevalence of vitamin A deficiency was 1.8% and 33.8% by Gupta et al [16], And Karnataka[28].

Wedner et al reported the prevalence of night blindness and bitot's spots as 5.3% and 0.6% respectively [17]. Girls (5.95%) were more affected with low vision in contrast to boys (3.5%) in our study. Female preponderance was observed in all age groups with highest prevalence in their earlier age group of 8-10 years (45.6%). Similar findings were also elicited in other studies [20,24].

It was found that schools, with children of low socio-economic status, had more children who were referred for correction of refractive error. This could be owing to malnutrition of children, poor availability of health services and less awareness of causes of visual problems. Considering the number of disability adjusted life years of visually impaired children, prevention should be the aim of all blindness control programmes along with the generation of awareness in the masses of the importance of eye care and to teach the essentials of ocular hygiene as well as eye health care. Our efforts too were concentrated on teaching them about the cause, prevention and cure of refractive errors, xerophthalmia and trachoma, good classroom illumination and visual acuity screening by Snellen's chart. Of all the children screened, less than 1/5th of students were referred. And on doing the follow up of those referred it was found that less than half of them contacted the health physician (Fig 2).

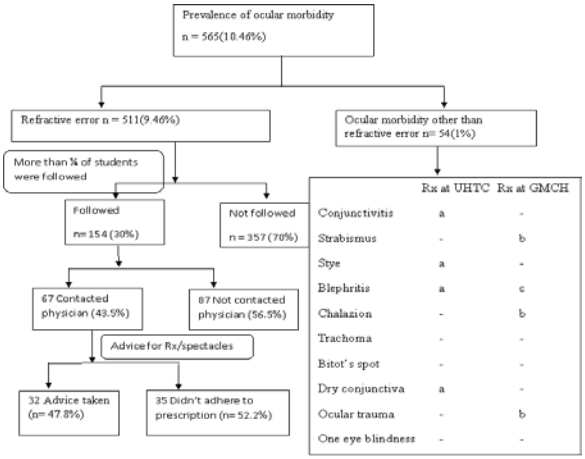

Fig. 2: Follow up and outcome of screened students

***WHO guidelines for place of management**

a=to be managed at primary level and actually managed, b=to be referred to higher level and actually referred

c= to be managed at primary level but referred to higher level

UHTC= Urban Health Training Centre, GMCH= Government Medical College & Hospital.

This depicts the gap in the awareness and need of getting the eye examination done. Children are dependent on their parent/ guardians for availing the vision services. And non involvement of parents was found to be a major barrier in procuring vision health by students. Other than this parent's economic constraints as well as lack of awareness of complications of uncorrected refractive error posed out to be some of the reasons for not visiting the health facility for availing eye care services. This in turn can affect the scholastic development of children and decrease their chances for better future earning capabilities. Hence, there is an imminent need of BCC (Behaviour Change Communication) strategies, community awareness and participation of masses in eye health programmes.

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