Research Article

Demographic profile of ocular morbidity in school children in India

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Abstract: The aim of the presented study was to find out the prevalence of ocular morbidity in school children in Pune city. It was a cross sectional study. The present study was planned to know the prevalence of ocular morbidity in school children in Pune city, and their correlation with socio demographic profile if any. The study was conducted in urban field practice area of a Medical College in Pune. School children of age 6-16 years of selected urban schools in the field practice area were the study population. The sample size calculated was 866 but 1157 were covered in this study. In present study prevalence of ocular morbidity in students were found 11.58%. So to conclude present study highlights important problem of ocular morbidity in school children. Refractory error was commonest form of ocular morbidity amongst them but most of it was undetected previously.
Keywords: Ocular morbidity, school children, Demographic profile, India.

INTRODUCTION:

Blindness is one of the significant social problems in India [1]. In India total child population in 2010 was 345 million and number of blind children was 2 ,80,000. The prevalence of blindness declined to 1.4% than previous data after vision 2020 [2]. Childhood eye morbidity is defined as "Any eye disease or condition that requires ophthalmic care and treatment which if untreated can often progress to serious and sight-threatening disease" [3]. The pattern of ocular diseases varies in different part of the world and is influenced by racial, geographic, socioeconomic and cultural factors [4]. Next to Egypt, India has the highest incidence of blindness in the world, particularly in younger age group and for prevention of blindness school is the best centre for implementing comprehensive eye health care [5]. The rate of infection and complication are influenced by a number of socio-economic and socio-cultural factors and season [6]. Children do not complain of defective vision and may not even be aware of their problem. They adjust to the poor eyesight by sitting near the blackboard, holding the books closer to their eyes, squeezing the eyes and even avoiding work requiring visual concentration. This warrants early detection and treatment to prevent permanent disability. Children in the school-going age group (6-16 years) represent 25% of the population in the developing countries. They offer significantly representative material for these studies as they fall best in the preventable blindness age group, are a controlled population i.e. they belong to a certain age group and are easily accessible and schools are the best forum for imparting health education to the children. Schools are also one of the best centres for effectively implementing the comprehensive eye healthcare programme [7]. A study of the pattern of ocular diseases in children is very important because while some eye conditions are just causes of ocular morbidity, others invariably lead to blindness. In the light of above facts and with very little data available on ocular morbidity in children especially in Maharashtra the present study was conducted to find out the prevalence of ocular morbidity in school children and common morbid conditions present amongst them. Early detection of ocular morbidity will thus prevent future progression of disease.

MATERIAL AND METHODS

It was a cross sectional study. The present study was planned to know the prevalence of Vitamin A in school children in Pune city, and their correlation with socio demographic profile if any. The study was conducted in urban field practice area of a Medical College in Pune. The UHTC caters about 60,000 populations. The study was done in one of the Municipal Schools and one of the Private English Medium Schools randomly chosen. There are 4 municipal schools and 5 private schools in the Urban Health Training Centre field practice area. One municipal school and one private school were selected randomly by lottery method.

Study population

School children of age 6-16 years of selected urban schools in the field practice area.

Inclusion criteria

All the Children in the age group of 6-16 years in the selected schools of urban field practice area.

Exclusion criteria

Those who are not willing to participate and absentees on the day of examination.

The Sample size was calculated by taking the prevalence of ocular morbidity in school children in 6-16 years age group i.e.31.6% [4].

Using this prevalence for finding out sample size following method is used.

Formula [8] $n = 4PQ/L^2$ is used

P= 31.6 % Q = 100-31.6 = 68.4

L= allowable error 10% of P = 3.16

Sample size $= 4PQ/L^2$

$$= 4 \times 31.6 \times 68.4/ (3.16)^2$$

$$= 865.82 = 866$$

The sample size calculated was 866 but 1157 were covered in this study. Before conduction of study training in Ophthalmology Department was undertaken to diagnose the Vitamin A in children till inter-observer error is minimized. It was of 15 days duration.

A pilot study was conducted in the same municipal school which is selected for study (50 students) and a questionnaire was finalized in order to collect information from the students and from parents.

The list of municipal and private school in field practice area of UHTC was obtained. There were 4 municipal and 5 private (English medium) schools. One municipal school and one private school were selected randomly by lottery method. Two different types of school were chosen to get different socio economic class of students. Permission of school authority was obtained .School authority was explained about nature of study. An informed consent from school authority was obtained. The information was collected in a predesigned and pretested proforma.

All the students in the age group of 6 to 16 years present on the days of examination in that school were examined. Snellen's chart in English/ Marathi was used on the basis of the student's preference. The students who could not read the Snellen's were assessed with the E charts. The cut off level of visual acuity to denote failure was fixed at less than 6/6 in either eye. Pinhole vision testing is done to differentiate refractive error from posterior chamber pathology (The visual acuity improves with pinhole if there is refractive error but it remains the same in posterior chamber pathology). Bitot's spot was noted clinically. Height, Weight was measured. BMI is determined, the student's age and gender were used to select the appropriate growth chart. After collection and editing of data, classification and tabulation was done under appropriate heading so as to obtain the summary values for further statistical treatment.

RESULTS AND DISCUSSION

Out of total 1157 students only 7.35% students were having some ocular complaint while 92.65% told no complaint.Students of municipal school have more complaint (7.90%) as compare to students of Private English medium (6.61%) school.

When students were asked about types of ocular complaints 62(72.94%) were having watering from eyes during reading while 23 (27.06%) had pain in eyes. Which was found significant .These complaints might be due to refractive error.

In present study prevalence of ocular morbidity in students was 11.58%.The prevalence was more in Municipal Corporation School (7.35%) while in Private English medium school it was 4.24% amongst total students although the difference was not significant.

The prevalence of ocular morbidity amongst municipal corporation school students were 12.92% while in private English medium school it was 9.82%.

Similar finding was observed by a study by Jha K N [9] in their Baseline Ophthalmic Data of School Children aged 15 years or younger in Leh, Jammu and Kashmir, India where they found that total 10.79 % were identified as having ocular morbidity. In other study by Lu P, Chen X, *et al.*[10] the Prevalence of ocular disease in Tibetan primary school children focused on assessing childhood ocular morbidities showed a similar prevalence of 11.07%. Prakash Prajapati, Jaydeep Oza, *et al.*[11] in their study they found that the prevalence of ocular morbidity among school adolescents was reported 13%.

On the other hand various other studies in India showed higher prevalence. Rajesh Kumar *et al.*[12] in their study observe that the prevalence of ocular morbidity was found to be 24.6%. Madhu Gupta, Bhupinder P Gupta *et al.*[13] conducted study on ocular morbidity prevalence among school children and observed that overall prevalence of ocular morbidity among school children of age 6-16 years was 31.6%. Ayanniyi A *et al.*[14]found in their study causes and prevalence of ocular morbidity among primary school children in Ilorin, 277 pupils had ocular pathology giving a prevalence of 19.9%. S Mahapatro *et al.*[15] found prevalence of ocular disorders in schoolchildren in rural area surrounding Bhubanesar was 16.8%. A study was conducted by Deshpande Jayant D *et al.*[16] to know prevalence of ocular morbidities among school children in rural area of north Maharashtra. A prevalence of ocular morbidities was found to be 27.65 %. In another study by Harpal singh [17] in Bhopal

Madhya Pradesh the prevalence of ocular morbidity was found in 14.5% of students. A study conducted by Wedner SH *et al.*[18]on 'Prevalence of eye disease in primary school children in Tanzania was 16.23% students.

These variations might be due to different geographical, socio economical, nutritional variations amongst study participants.

Amongst the total students prevalence of refractory error was 6.22% followed by Vitamin A deficiency (2.77%), conjunctivitis (1.47%), and stye (1.12%). Amongst both types of school refractory error was commonest ocular morbidity. When different types of ocular morbidity were concerned refractory error was more in private english medium school while Vitamin A deficiency, Infection (Conjunctivitis and stye) were more in municipal corporation school. In municipal school almost one third (30.59%) of ocular morbidity was due to Vitamin A deficiency.

Significant correlation was found between types of ocular morbidity and students of different schools. This variation might be due to different socioeconomic status, Nutritional variations, more hours of working on computer and watching TV, personal hygienic conditions.

Out of the total ocular morbidity 134 (100%), (53.73%) constitute the refractive errors as a major cause of ocular morbidity followed by, vitamin A deficiency (23.88 %) and conjunctivitis (12.69 %).

Amongst the ocular morbidities proportion of refractive errors in private schools was more (3.54%) and in municipal school it was 2.68%. However, the proportion of vitamin A deficiency and conjunctivitis in municipal school was more (2.25 % and 1.38%) as compared to private school which was 0.52 % and 0.09 % respectively. Another ocular morbidity found was stye 1.04% in municipal corporation school as compared to private english medium school (0.09%). Similar to present study finding is commonest ocular morbidity as refractory error as commonest ocular morbidity though the prevalence of refractory error varied from study to study.

Table 1: Distribution of students according to ocular complaints

Sl. No.	Variables	Number (n=1157)	Percentage (%)	P value
Distribution of students according to the ocular morbidity				
1	**Present**	134	11.58	
2	**Absent**	1023	88.42	
Distribution of students according to ocular complaints				
1	**Yes**	85	7.35	
2	**No**	1072	92.65	
Distribution of students according to types of ocular complaints				
1	**Watering from eye**	62	72.94	χ^2=9.25, df =1,
2	**Pain in eye**	23	27.06	p value=.00235
Distribution of students according to the type of ocular morbidity				
1	**Refractive Error**	72	53.73	χ^2= 28.842, df= 3,
2	**Vitamin A deficiency**	32	23.88	p value= 0.00000242
3	**Conjunctivitis**	17	12.69	
4	**Stye**			
Age wise distribution of students with ocular morbidity				
1	**6-8**	28	20.9	χ^2= 10.09, df=3,
2	**9-11**	44	32.84	p value= 0.0178
3	**12-14**	33	24.63	
4	**15-16**	29	21.64	
Gender wise distribution of students with ocular morbidity				
1	**Male**	72	53.73	χ^2= 1.16, df=1,
2	**Female**	62	46.27	p value= 0.2808
Religion wise distribution of students with ocular morbidity				
1	**Hindu**	127	94.78	χ^2=0.01, df =1,
2	**Muslim**	7	5.22	p value=0.9

Table 2: Distribution of students with ocular morbidity

Distribution of students with ocular morbidity according to Type of family				
1	**Nuclear family**	60	44.78	χ²=5.57, df =2, p value=0.062
2	**Joint family**	73	54.48	
3	**Three generation Family**	1	0.75	
Distribution of students with ocular morbidity according to Socio economic condition				
1	**Class I**	5	3.73	χ²=26.511, df =4, p value=0.000024, Montecarlo p value=0.001
2	**Class II**	100	74.63	
3	**Class III**	21	15.67	
4	**Class IV**	6	4.48	
5	**Class V**	2	1.49	
Distribution of students according to the type of ocular morbidity				
1	**Refractive Error**	72	53.73	χ²= 28.842, df= 3, p value= 0.00000242
2	**Vitamin A deficiency**	32	23.88	
3	**Conjunctivitis**	17	12.69	
4	**Stye**	13	9.70	
Distribution of students with ocular morbidity according to literacy status of father				
1	**Illiterate**	13	9.7	χ²=14.91, df =4, p value=0.0049
2	**Primary**	45	37.31	
3	**Secondary**	11	12.69	
4	**Higher Secondary**	53	29.1	
5	**Graduate or more**	12	11.2	
Distribution of students with ocular morbidity according to literacy of status of mother.				
1	**Illiterate**	13	9.70	χ²=85.9, df =4, p value= 0.00001
2	**Primary**	45	33.58	
3	**Secondary**	11	8.21	
4	**Higher Secondary**	53	39.55	
5	**Graduate or more**	12	8.96	
Diet wise distribution of students with ocular morbidity				
1	**Vegetarian**	24	17.91	χ²=7.7, df =1, p value= 0.0055, Odds ratio=1.97
2	**Mixed**	110	82.09	
Distribution of students with ocular morbidity according to Nutritional status.				
1	**Under weight**	56	41.79	χ²=3.17, df =3, p value= 0.3668
2	**Normal**	23	17.16	
3	**Over weight**	54	40.3	
4	**Obese**	1	0.75	

Kehinde A V *et al.*[19] in School eye health screening in Kaduna Northern Nigeria, found that the commonest types of eye disorders were Vernal/Allergic conjunctivitis 109(4.55 %), Refractory error 41(1.71%), Infective conjunctivitis 33(1.38%), Subconjunctival hemorrhage 4 (0.17%), Stye 3(0.13%), corneal opacity 2(0.08%), optic atrophy 1(0.04%), molluscum contagiosum1(0.04%), squint 1 (0.04%), other 7(0.29%) (Distichiasis hyaloids artery remnant) of the total 2397 students.

A study was conducted by Deshpande Jayant D *et al.* [16] to know prevalence of ocular morbidities among school children in rural area of north Maharashtra. In their study types of ocular morbidities

found were Refractive errors (36.62%), Vitamin A deficiency (25.58%), conjunctivitis (9.3%), Squint (6.39%), Injury (3.48%), Blepharitis (3.48%), Petrygium (2.9%), chalazian (2.9%), Trachoma (2.9%) color blindness (1.74%), subcunjunctival heamorrhage(1.74%), Stye (1.74%) and cornial opacity(0.58%), ptosis (0.58%).

Rajesh Kumar *et al.* [12] in their study found that the commonest types of diseases in urban school students were trachoma(4.9%), conjunctivitis (4.3%), xerophthalmia(3.6%), uncorrected refractive error (3.3%), stye(1.0%), Blepharitis (1.3%), color blindness(1.0%), chalazian(0.8%), cornial opacity (0.5%), pinguicula(0.3%), subcunjunctival

heamorrhage(0.3%), and posterior chamber pathology (1.3%).

Madhu Gupta *et al.*[13]conducted study on ocular morbidity prevalence among school children and observed that Refractive errors (22.0%) constitute the major cause of ocular morbidity followed by squint (2.5%), colour blindness (2.3%), vitamin A deficiency (1.8%), conjunctivitis (0.8%), and stye was found in 0.9%.

Ayanniyi A *et al.* [14] found in their study that two most common ocular disorders found among the pupils were refractive errors and vernal conjunctivitis with prevalence of 6.9% and 6.7% respectively. Others included genetic / congenital / developmental ocular disorders 39 (2.8%), glaucoma / glaucoma suspect 20 (1.4%), ocular infections 18 (1.3%), and ocular trauma 11 (0.8%).

In another study by Harpal singh [17] in Bhopal Madhyapradesh he found that out of ocular morbidity was diagnosed 3016 amongst total 20800 students, Refractive Error was found in 1445(47.91%),Vitamin A Deficiency was found in 412 (13.66%), Strabismus was diagnosed in 63(2.08%), Infective Condition in 439 (14.55%),Corneal Opacity in 177(5.86%), developmental cataract in 108(3.58%), traumatic Eye Injury in 161(5.33%), miscellaneous 211(6.99%).

A study conducted by, Wedner SH *et al.* [18] on Prevalence of eye disease in primary school children in Tanzania in their study they found that the commonest types of diseases in urban school students were trachoma (5.56%) and night blindness (5.27%). Other ocular diseases was Amblyopia (0.22%), Vernal keratoconjunctivitis (0.36%), refractive error (1.01%), Bitot's spots (0.58%), Strabismus (0.51%), Corneal scar (0.79%), Cataract (0.22%), Macular disease (0.29%), and Other 1.44%.

In another population based study in Gujarat conducted by Vivek T, Sandip Z, et al.[23] they found that in urban area refractory error was main cause of ocular morbidity (7.5%), various other causes of visual impairment like conjunctival abnormalities in5.1% children, including 3.9% children with bitots spots ,eye lid abnormalities (mainly Blepharitis) in 0.93% children, corneal abnormalities were observed in 0.39%, Pupillary abnormalities in 0.37% children and lenticular abnormalities were present in 0.37% children.

A study was conducted by Prakash Prajapati *et al.* [11] they found that types of ocular morbidity was Refractive errors 40.1%, Colour blindness 5.1%,Vitamin A deficiency 29.3%, Trachoma 2.5%, Conjunctivitis 3.8%, Stye 5.1%, Pterygium 5.1%, Injury 3.1%, Blepharitis 5.7%. Maximum i.e. 32.84 % of children with ocular morbidity were in the age group of

9-11 years, 24.63 % between 12-14 years, 21.64 % between 15-16 years and remaining is 20.9% between 6-8 years. The prevalence of ocular morbidity was (36.73%) in 12-14 years in Private English Medium School as compared to Municipal corporation school where it was more common in 9-11 years (32.94%).

Rajesh Kumar *et al.* [12] found that 7-8 years students had 34.7%, 9-10 years 32.3%, 11-12 had 13.3%, 5-6 years children have ocular morbidity 17.7% and 13-14 years had 2.0%.

Jha KN [9] in his Baseline Ophthalmic Data of School Children aged 15 years or younger in Leh, Jammu and Kashmir, India found that in 5-6 years age group had ocular morbidity of 17.7%, 7-8 years 32.3%,9-10 years 34.7%, 11-12 years 13.3%, 13-14 years 2.0% respectively.

In another study by Harpal Singh [17] in Bhopal Madhya Pradesh he found that of the total 3016 students diagnosed as ocular morbidity 476(15.78%) students were 5 – 8 years,1423 (47.18%) were at age of 9-12 years and 1117 (37.04%) students were 13-16 years. The study finding was not coinciding with various studies. When association was tested between age groups and ocular morbidity it was found that a significant association exists between age of students and ocular morbidity. Out of the total 1157 students ocular morbidity was more prevalent in the male children (6.22 %) i.e.72 compared to female children (5.36 %) i.e. 62. Majority of males i.e.53.73% had ocular morbidity as compared to females 46.27%. He also found that out of total ocular morbidity 7.77% ocular morbidity were in males and 6.72% in females.

Similar observation was made by a study done by B P Nepal *et al.* [20] in schoolchildren in Kathmandu in Nepal found that the 5.10% males were having ocular morbidity and 5.9 % females were having ocular morbidity.

But high prevalence was found by Madhu Gupta *et al.* [13] in a study on ocular morbidity prevalence among school children and observed that total 32.5% male and 30.6% female were having ocular morbidity.

Amongst the students with ocular morbidity males were over numbered (53.73%) females (46.27%). It was higher in both the schools and in total also. When association was tested between gender and ocular morbidity it was found that there was no association found between gender and ocular morbidity.

Similar findings were observed by Deshpande Jayant D [16] to know prevalence of ocular morbidities among school children in rural area of north Maharashtra. In their study 55.95% boys and 44.05% girls have ocular morbidity.

Prakash Prajapati *et al.* [11] found in their study that out of total students having ocular morbidity 56.69 % were males and 43.31% were female.

In present study although the percentage of Muslim students were less but the proportion wise both Hindu and Muslim have about same ocular morbidity 11.61% (127 out of 1094) and 11.11% (7 out of 63) respectively. Amongst students with ocular morbidity Hindu were 94.78% and Muslims were 5.22%.

A study was conducted by Deshpande Jayant D [16] to know prevalence of ocular morbidities among school children in rural area of north Maharashtra. In their study ocular morbidity was more in Hindu (20.73%) students and Muslim, Christian and Others had 6.10%, 0.32% and 0.48% respectively.

An observation was found by Rajesh Kumar *et al.* [12] in Delhi that Compared to Hindu subjects (22.1%), prevalence of ocular morbidity was almost two times higher in subjects of other religions (41.66%). But this difference might be due to very small number of subjects from other religions.

In present study association was not found between ocular morbidity and religion. Among the total students (1157) 5.18% of students were belonged to nuclear family and had ocular morbidity. The corresponding figure for joint family and three generation family were 6.3% and 0.08%.

Similar observation was found by Prakash Prajapati [11] in their study where they found that 6.55% students who had ocular morbidity belonged to Nuclear family and 6.47 % with Joint family.

But higher prevalence was found by Deshpande Jayant D *et al.* [16] that is 13.2% students belonged to Nuclear family and 14.63% were from Joint family. Amongst students with ocular morbidity maximum i.e. 54.48% belonged to joint family, 44.78% nuclear and only 0.75% to three generation .Among students of municipal school maximum i.e. 85.88% belonged to joint family but in private school all belonged to nuclear family. This might be because of distribution of students in different types of families in both schools. The prevalence of ocular morbidity was more in joint family students (14.04%) as compared to other families i.e. nuclear (9.58%) and three generation family (9.1%). The association was not found to be significant between type of family of student and ocular morbidity. Amongst all students (1157) maximum students (8.64%) belonged to class II Socio-economic status and had ocular morbidity. The corresponding figures for class III, IV, I, V were 1.81%, 0.52%, 0.45% and 0.17% respectively.

Similar type of result were found by Deshpande Jayant D *et al.*[16] in north Maharashtra that the students with ocular morbidity belonged to Class I Socio-economic status were 3.53%. 5.46% students were from Class II, 4.34 % Class III, while Class IV and Class V had 9.16%, 5.14% respectively. Amongst the students with ocular morbidity maximum belonged to class II (74.63%) and minimum in class V(1.49%).This might be due to more number of students belonged to class II Socio-economic status in both the schools. When Socio-economic status wise prevalence was calculated maximum i.e.100% was found in class V followed by class IV (23.08%), class III (15.56%), class II(11.36%),and least in class I (4.39%) indicating that as Socio-economic status decreases ocular morbidity increases..

A highly significant association was found between Socio-economic status and ocular morbidity. As socio economic status affects nutritional status, health care services availability it may lead to association between socioeconomic status and ocular morbidity.

Prakash Prajapati *et al.* [11] in Gandhinagar District, Gujarat found that class I, II, III had 7.79% students with ocular morbidity and 5.22 % students belonged to class IV and V who had ocular morbidity. Ocular morbidity with respect to literacy status of father revealed that out of 134 students having ocular morbidity 9.70 % students' father were illiterate, 37.31 % were educated up to Primary, 9.24 % were up to secondary, 29.10 % up to higher secondary, 11.2 % up to Graduate & more.

Prakash Prajapati *et al.* [11] Gandhinagar District, Gujarat found that of ocular morbidity was present in 16.6% of students whose father were illiterate, 16.6% with primary educated, 24.2% secondary, 21.0% were higher secondary and 21.7% students father were graduate and more.

In a study by Deshpande Jayant D *et al.* [16] in rural area of north Maharashtra found that ocular morbidity was present in 1.44 % of students whose father were illiterate, 6.91%, with Primary educated, 8.84% Secondary, 6.10% were higher secondary and 4.34% students father were graduate and more. The prevalence of ocular morbidity was more in children whose father were illiterate (19.70%) i.e. 13 out of 66 as compare to literate father 11.09% i.e. 121 out of 1091.

An association was found between literacy status of father and ocular morbidity. Because of illiteracy there is ignorance and leading to poverty, poor health including ocular morbidity also.

Ocular morbidity with respect to education of mother revealed that out of 134 students having ocular

morbidity 9.70 % students' mother were **i**lliterate 33.58% were educated up to Primary, 8.21% were up to secondary 39.55 % up to Higher secondary, 8.96 % up to Graduate & more.

Prakash Prajapati, Jaydeep Oza *et al.* [11] found that in subjects with ocular morbidity, 19.7% of students mother were illiterate, 21% were primary educated ,23.6% secondary, and 19.1% were higher secondary and 16.6% students mother were graduate and more.

In a study by Deshpande Jayant D, Malathi K [16] found that students having ocular morbidity, 1.9% student's mother were illiterate, 5.62% Primary, 7.55% Secondary, 7.87% higher secondary and 4.66% Graduate & more. The prevalence of ocular morbidity was more in children whose mother were illiterate (21.31%) i.e. 13 out of 61 as compare to literate mother (11.04%) i.e. 121 out of 1096.

A significant association was found between mother's literacy and ocular morbidity. It might be because of illiteracy there may be ignorance, poverty and leading to various disease conditions like ocular morbidity.

As compared to father's literacy, mother's literacy status was more important with respect to ocular morbidity as mother is usually with the child, looking after him, taking care in illness as compared to father.

Of the total 134 students with ocular morbidity 17.91% were vegetarian while 82.09% were consuming mixed diet. In municipal school 19.80% vegetarian students were having ocular morbidity the corresponding figure for mixed diet was 11.67%. While in Private school where 16% vegetarian students were having ocular morbidity the corresponding figure for mixed diet was 9.49 %.

Similar finding were found by Viswa Teja et al [21] in their study from Urban Areas of Visakhapatnam, India that 87.9% of students having mixed diet had ocular morbidity and 12.1% who were vegetarian.

A significant association was found between types of diet and ocular morbidity in school children. The prevalence of ocular morbidity among vegetarian students was 19.05% (24 out of 126) as compared to mixed diet i.e. 10.07% (110 out of 1031).The mixed diet contains non vegetarian diet like meat, chicken which is rich source of nutrients specially vitamin A. Out of the total subjects with ocular morbidity 41.79 % students were underweight, followed by overweight 40.3%, normal weight 17.16 % and obese 0.75%.

In a study by Deshpande Jayant D et al.[16] in north Maharashtra found that malnourished students had ocular morbidity 10.93% and normal weight students had 16.72% ocular morbidity. Amongst total 1157 students 4.85% students with ocular morbidity were underweight 4.66% were overweight, 0.08% obese and 1.98% normal weight.

But in study by Prakash Prajapati et al [11] found that 1.99% students were underweight have ocular morbidity while 3.32 % ocular morbidity were in over weight and 0.58 % in students belonged to obese while 6.96% in normal students .

No association was found between nutritional status and ocular morbidity.

CONCLUSION

In present study prevalence of ocular morbidity in students were found 11.58%.Amongst the total students prevalence of refractory error was 6.22% followed by Vitamin A deficiency (2.77%), conjunctivitis (1.47%), and stye (1.12%).

Ocular morbidity was more common in age group of 9-11 years(32.84%), males (53.73), Hindus (94.78%), students belonging to joint family (6.3%), class V Socio-economic status (8.64%). Out of the total ocular morbidity 9.70% student's mother were illiterate and 33.58% were educated up to Primary. Ocular morbidity was also more (82.09%) in those students who were consuming mixed diet while 41.79% students were underweight had ocular morbidity. Ocular morbidity was most common in the students and was found maximum (37.31%) in those students whose fathers were educated up to primary in those students whose fathers were educated up to primary. Significant association was found between ocular morbidity and religion, Socio-economic status, student's mother education, father's education. Ocular morbidity was also significant with student's diet. There was no association found between ocular morbidity and age group, gender, type of family, nutritional status of students.

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