VOLUME - 10, ISSUE - 03, MARCH - 2021 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Physiology

REFRACTIVE ERRORS AND NUTRITIONAL STATUS IN SCHOOL GOING CHILDREN: A COMPARATIVE STUDY

Dr Minu Liz Abraham	Assistant Professor, Dept of Physiology, MOSC Medical College, Kolenchery.
Dr Elizabeth Samuel*	Assistant Professor, Dept of Physiology, MOSC Medical College, Kolenchery. *Corresponding Author
Ms Ceema Varghese	Lecturer, Dept of Physiology, MOSC Medical College, Kolenchery.

ABSTRACT A non experimental comparative study using a quantitative approach was designed to estimate the prevalence of myopia among school children in relation with nutritional status. Nutritional status is portrayed as variations in the level of BMI among study subjects. Study was conducted at selected schools of Kolenchery in the state of Kerala. Sample was recruited using a convenient sampling strategy and the sample size calculated was 966. Written informed consent from parents, setting permission from school authorities and ascent from study subjects was obtained prior to data collection after ensuring the confidentiality of data being collected. Data was collected using a structured questionnaire which was prepared after extensive review of literature and reliability, validity of the tool was also ensured. Findings revealed the frequency and percentage distribution of subjects according to occurrence of myopia in relation with BMI in three categories and the analysis reveals that presence of myopia among High, Low and Normal category of BMI of total 966 subjects was 23 (33.8%), 102 (22.8%) and 111 (24.6%) among school going children. There was not statistically significant association between groups on analysis using chi square at $p < 0.05$ level of significance.

KEYWORDS : Refractive errors, Nutritional status, Myopia, School children.

INTRODUCTION

Vision is important in development because it allows children to interact with their environment. Vision in preschool children is uniquely important because their visual system is still developing and they are at risk of developing disorders of eye Deprivation may lead to long term visual impairment. A refractive error may be defined as a state in which the optical system of the non accommodating eye fails to bring parallel rays of light to focus on the retina. In children, refractive errors are the leading cause of amblyopia[1]. Although these errors are easily correctable with eyeglasses, various studies in children and adults report a considerable lack of correction. Myopia prevalence rates vary more widely than hyperopia and range from 0.3% in Nepal to 38% in China as opposed to 1.1% to 18% for hyperopia[2,3].

Myopia, commonly referred to as short sightedness is a form of refractive error and is a very common cause of visual disability throughout the world. The condition may present as blurred distance vision, eye rubbing and squeezing of the eyes. School myopia commences around 5-15 years of age and tends to stabilize in the late teens and is mainly thought to be idiopathic. High myopia may be associated with myopic macular degeneration, cataract, glaucoma, peripheral retinal changes (such as lattice degeneration, retinal holes and tears) and retinal detachment[7].

Population-based studies for the age group 5–15 years have estimated the prevalence of blindness as 1.25/1000 and 0.53/1000 children in rural and urban areas, respectively[4,5].A comprehensive data on causes and prevalence of ocular morbidity in children is essential for planning and evaluating, preventive and curative services for children in a given region. The prevalence of childhood blindness is very difficult to ascertain, and there is not enough reliable data from developing countries. In India, there have been few published studies from northern, southern, eastern, and western parts of India. But there has been a lack of comprehensive data on ocular co-morbidities from central India, especially, in school-going children.

A cross sectional study conducted by Anupam S (2020) with a sample size of 1557 among eligible school-going children in the age group 5–15 years, reported that ocular morbidity was present in a total of 331 (21.2%) children. Vitamin A deficiency was the most common cause of ocular morbidity, noted in 156 (10%) children, followed by refractive error (81, 5.2%). Myopia was significantly higher in urban school children (4.3%) compared to rural children (1.9%) ($P = 0.002$). The older age group had a higher prevalence (7.6%) of refractive error, especially myopia, compared to the younger age group (2.2%) ($P < 0.001$)[6].

In view of above literature background researchers was spearheaded towards this study to find out occurrence of myopia in relation with nutritional status among school going children.

MATERIALS AND METHODS

This non experimental comparative study using a quantitative approach was designed to estimate the prevalence of ocular morbidities especially myopia among school children in relation with nutritional status. Nutritional status is portrayed as variations in the level of BMI among study subjects. Study was conducted at selected schools of Kolenchery in the state of Kerala . Sample was recruited using a convenient sampling strategy and the sample size calculated was 966. Written informed consent from parents, setting permission from school authorities and ascent from study subjects was obtained prior to data collection after ensuring the confidentiality of data being collected. Data was collected using a structured questionnaire which was prepared after extensive review of literature and reliability, validity of the tool was also ensured. After getting informed consent from each student, height, weight and visual acuity were examined. The stadiometer and weight machine were used to collect the data about height and weight and represented in centimetres and kilograms respectively. The body mass index was calculated using the formula height (m2) / weight (kg). Snellen's chart was used to test the visual acuity for distant vision .The refractive values were collected based on the information given by students themselves. Newly diagnosed students were asked to review with an ophthalmologist and their vision was

checked. Data was analysed using appropriate inferential and statistical techniques in order to meet the study objectives.

RESULTS

Socio demographic data

Table 1: BMI, sample size, mean and standard deviation, F score and p value of socio demographic variables. (n=966)

Socio demographic variables	BMI	N	Mean	Std. Deviation	F	p
Age	High	68	15.294	1.507	33.765	0.000
	Low	447	13.723	1.869		
	Normal	451	14.512	1.844		
Height	High	68	1.646	0.115	22.527	0.000
	Low	447	1.565	0.111		
	Normal	451	1.598	0.099		
Weight	High	68	75.691	12.872	663.229	0.000
	Low	447	40.188	7.396		
	Normal	451	53.521	8.375		
BMI	High	68	27.790	2.507	1678.408	0.000
	Low	447	16.277	1.470		
	Normal	451	20.876	1.833		

Table 1 reveals the distribution of sample based on variables such as age, height, weight and BMI. From the table it is clear that mean age among High, Low and Normal category of BMI was 15.294±1.507, 13.723±1.869 and 14.512±1.844 respectively. Mean height of subjects among High, Low and Normal category of BMI was 1.646±0.115, 1.565±0.111 and 1.598±0.099. Regarding the mean BMI of subjects among High, Low and Normal category of BMI was 27.790±2.507, 16.277±1.470 and 20.876±1.833.

Table 2: Frequency and percentage distribution of subjects according to occurrence of myopia in relation with BMI (n=966)

			Myopia			
			Group			Total
			High BMI	Low BMI	Normal	
Status	Myopic	Frequency	23	102	111	236
		Percentage	33.8%	22.8%	24.6%	24.4%
	Not Myopic	Frequency	45	345	340	730
		Percentage	66.2%	77.2%	75.4%	75.6%
Total		Frequency	68	447	451	966
		Percentage	100.0%	100.0%	100.0%	100.0%
x2=3.887 p=0.143 NS						

Table 2 shows the frequency and percentage distribution of subjects according to occurrence of myopia in relation with BMI in three categories and the analysis reveals that presence of myopia among subjects among High, Low and Normal category of BMI of total 966 subjects was 23 (33.8%), 102 (22.8%) and 111 (24.6%) among school going children. There was not statistically significant association between groups on analysis using chi square at $p < 0.05$ level of significance.

DISCUSSION

In this study occurrence of myopia in relation with BMI in three categories and the analysis reveals that presence of myopia among subjects among High, Low and Normal category of BMI of total 966 subjects was 23 (33.8%), 102 (22.8%) and 111 (24.6%) among school going children. There was not statistically significant association between groups on analysis using chi square at $p < 0.05$ level of significance. Similar findings were seen in a meta analysis conducted by Agarwal D (2020) reported findings from the last four years also depicted similar results. In that study they stated that, they have included data from 59 quality assessed studies, covering nearly 1,66,000 urban and 1,20,000 rural children. The overall crude prevalence of myopia over last four decades is 7.5% (95% CI, 6.5–8.5%) in 5-15-year age group. The prevalence of myopia is 8.5% (95% CI, 7.1–9.9%) in urban and 6.1% (95% CI, 4.5–7.7%) in rural children, with highest prevalence in urban 11-15-year age group [15.0% in last decade]. A significant increment in prevalence is noted in the last decade in rural children from 4.6% to 6.8%, reflecting changing rural environment[8].

School eye screening is a cost-effective method that plays a vital role in early detection, prevention and treatment of childhood blindness/visual impairment. Nonetheless, the incidence of childhood blindness is very difficult to ascertain, and there is not much reliable data from developing countries. Likewise, not much data is available in the southern region of India, especially in rural sector.

Conflict of interest

None declared.

REFERENCES

1. Donahue SP. Prescribing spectacles in children: a pediatric ophthalmologist's approach. Optom Vis Sci. 2007;84:110–4.
2. Simons K. Preschool vision screening: rationale, methodology and outcome. Surv Ophthalmol. 1996;41:3–30.
3. Simons K. Old age and the functional consequences of amblyopia. J AAPOS. 2008;12:429–30.
4. Dandona R, Dandona L, Srinivas M, Sahare P, Narsaiah S, Munoz SR, et al. Refractive error in children in a rural population in India. Invest Ophthalmol Vis Sci. 2002;43:615–22.
5. Murthy GVS, Gupta SK, Ellwein LB, Muñoz SR, Pokharel GP, Sanga L, et al. Refractive error in children in an urban population in New Delhi. Invest Ophthalmol Vis Sci. 2002;43:623–31.
6. Agrawal D, Sahu A, Agrawal D. Prevalence of ocular morbidities among school children in Raipur district, India. Indian J Ophthalmol. 2020 Feb;68(2):340-344.
7. Saxena R, Vashist P, Menon V. Is myopia a public health problem in India? Indian J Community Med. 2013 Apr;38(2):83-5. doi: 10.4103/0970-0218.112436.
8. Agarwal D, Saxena R, Gupta V, Mani K, Dhiman R, Bhardawaj A, et al. (2020) Prevalence of myopia in Indian school children: Meta-analysis of last four decades. PLoS ONE 15(10): e0240750. https://doi.org/10.1371/journal.pone.0240750.