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Association between Digital Screen Time and Myopia among Medical Students in a Teritary Care Center in Chengalpattu District

Dr. Suganya*1, Dr. Gnaneswaran2, Dr. Susaritha3, Dr. Deborah Rinitamartin4

1,2,3 Department of Ophthalmology Karpaga Vinayaga Institute of Medical Science and Research Center,

Mathuranthakam, Tamilnadu, India.

4 Department of Ophthalmology Shri Sathya Sai Medical College and Research Institute, Ammapetai, Tamilnadu, India.

*Corresponding Author: 1 suganyaelango30@gmail.com

Abstract:

Purpose: The prevalence of refractive error among student has increased due to home confinement   hence this study was done to find out the   association between digital screen time and myopia   among medical student in teritary care center.

Method:A Cross sectional study was done among the medical students of a tertiary care center in Tamil Nadu from January 2022 to March 2022. Complete enumeration of all the 300 medical students from 3 different batches in the college were done.questions pertaining to the symptoms and diagnosis of refractory error and screen time was collected. The students who had symptoms suggestive of myopia were screened in the Opthalmology department of the institute. Association between quantitative variables were calculated by chi square test. P value < 0.05 considered statistically significant.

Result: The prevalence of myopia among medical students was 69.1%, in which 178 (66.1%) were known cases of myopia using spectacles / contact lens. Among those who were diagnosed case of myopia 70 (26%) had a refractory check up within last 1 year On this screening about 8 (3%) were newly diagnosed with myopia.(Figure 1) About 39 (14.4%) had progression of myopia in the last 1 year The mean duration of screen time among medical students was 10.3 ± 2.8 hours / day.

Conclusion: The study concluded that the prevalence of myopia among medical students and there was a significant association between digital screen time and myopia among medical students.This rapid rise of myopia is important public health issues and need urgent and special attention.

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1. Introduction

Myopia is the refractory error where the parallel rays of light entering the eye are brought to a focus anterior to the retina. This condition leads to life long dependence on visual aids and hence contributes to higher proportion of OPD attendance.(1)Though varied genetic and environmental factors have shown to play a role in the development of myopia.(2)In current times gadgets play a significant role in day today living and hence the effects of digital devices on young people are to be explored. People use computers and hand-held devices for many hours in a day.(3)This pandemic has made people more dependent on digital devices.Prolonged concentration in near work is a risk factor for myopia and have attempted to find a definitive link between the time spent on screens and myopia.(4)(5)Increased myopia has serious implications for the access and cost(6) of healthcare as well as the quality of life for people all over the globe. Over time, researchers have studied the effects and prevalence of myopia. Studies have shown the increasing trend of myopia in India over the last four decades.(7) a potential modifiable environmental risk factor that increases risk of myopia is a digital screen time. Thus the current study aims to find the association between digital screen time and myopia among medical students in a teritary care center in chengalpattu district.

2. Materials and Methods

A Cross sectional study was done among the medical students of a tertiary care center in Tamil Nadu from January 2022 to March 2022.Complete enumeration of all 300 medical students from 3 different batches in the college were done. Those who were diagnosed with hypermetropia, astigmatism, or had undergone surgery for refraction and using topical medications in eye like atropine were excluded from the study. Study was done using a pre designed pre tested self administered questionnaire sent through google forms. Information about demographic profile and questions pertaining to the symptoms and diagnosis of refractory error and screen time was collected. The students who had symptoms suggestive of myopia were screened in the Opthalmology department of the institute. Data was cleaned for errors and missing values, and then the corrected data was analysed by SPSS 16 version. Frequencies and proportions were calculated. Measures of central tendency were calculated. Association between quantitative variables were calculated using chi square test. P value < 0.05 was considered statistically significant. Before the starting the study ,Informed consent was obtained from each student . Ethical clearance was obtained from the institutional ethical committee.

Operational Definitions

Myopia was defined as participants with diagnosed with myopia or those found to be myopes on screening with Snellen chart during the study.Progression of myopia was considered if there was a history of change or change in minimum of 0.5 DS in the last 1 year among myopes and development of myopia in the last 1 years among previously non myopes.Screen time was considered as self reported duration of use of either mobile phone, laptop or TV or anyother gadgets with screen.

3. Results

There were 100 students in batch of MBBS and hence the total sample size was 300 participants with a non response rate of 4 (1.3%) and 27 (9%) not meeting the study criteria(they either had hypermetropia / astigmatism / had undergone surgery for refractory error).Hence the results of 269 participants are presented here.

Socio-Demography:

The age of the student ranged between 18-29 years with a mean of 21.1 ± 1.4 years.

Myopia:

The prevalence of myopia among medical students was 69.1%, in which 178 (66.1%) were known cases of myopia using spectacles / contact lens. They were on an average using spectacles / contact lens for 5.8 ± 3.1 yrs. Among those who were diagnosed case of myopia 70 (26%) had a refractory check up within last 1 year and were using power correction lens as per the last check up values. The remaining 91 were subjected to screening for myopia using snellen chart. On this screening about 8 (3%) were newly diagnosed with myopia.(Figure 1)About 39 (14.4%) had progression of myopia in the last 1 year. Most of the students 164 (60.9%) had at least 1 symptom suggestive of refractory error / progression in refractory error.(Figur2)
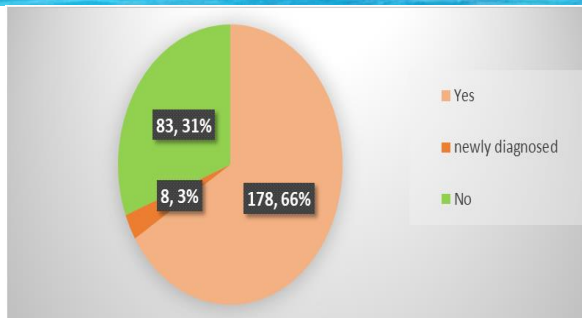
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Figure 1: Showing prevalence of myopia among medical students.(N=269)

students. (table2)

Table 1: Showing relation between occurrence of Myopia and family history of high myopia. (N=269) *Chi square test

Family h/o high myopia	Myopia			p value*
	Present	**Absent**	**Total**	
Yes	38 (76%)	12 (24%)	50 (12.2%)	0.2
No	148 (67.6%)	71 (32.4%)	219 (53.3%)	
Total	186 (69.1%)	83 (30.8%)	269 (100%)	
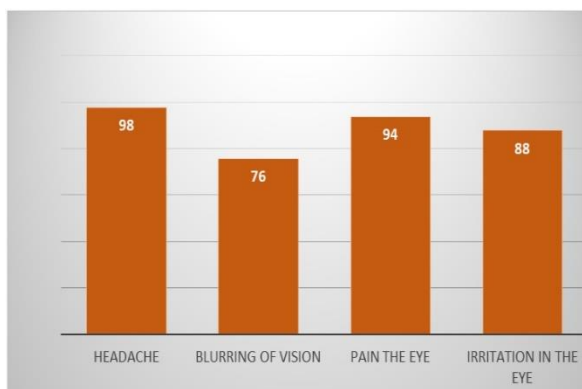
Figure 2: Showing distribution of symptoms of refractory error.(n=164)

Table 2 A significant association was found between a higher screen time (>6 hrs /day) and presence of myopia

DURATION OF SCREEN TIME	Myopia			P value
	Present	*Absent*	*Total*	
<6HOURS/DAY	6(85.7)	1(14.3)	7(2.6)	
>6HOURS/DAY	180(68.7)	82(31.3)	262(97.4)	<0.01
TOTAL	186(69.1%)	83(30.8%)	269	

Screen Time:

The mean duration of screen time among medical students was 10.3± 2.8 hours / day.The average duration of use/ day was highest for Mobile phone screen with mean duration of 5.4 ± 1.8 hours / day. (Figure 3)
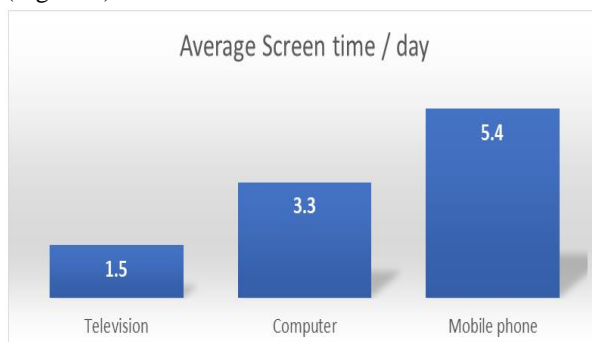

Figure 3: Showing average screen time use by medical students.(N=269)

Table: 3 Showing age and gender distribution of the participants. (N==269)

Age	Gender		
	Female	**Male**	**Total (% with gender)**
≤ 20 years	47 (62.7%)	28 (37.3%)	75 (27.9%)
21-23 years	108 (58.7%)	76 (41.3%)	184 (68.4%)
24-26 years	4 (50%)	4 (50%)	8 (3%)
27-29 years	2 (100%)	0	1 (0.7%)

Myopia and Screen Time:

Though the family history of myopia, show the prevalence of myopia was slightly higher and their difference was not statistically significant.(Table 1)

There was a significant association between higher digital screen time and myopia among medical

4. Discussion

The current study show that the prevalence of myopia among medical students was 69.1%.Sood RS, et al.,(8)Chow YC, et al.,(9)and Woo WW, et al.,(10) also studied myopia on medical students and reported a prevalence of 45%, 82% and 89.8% respectively. But most of the other global studies in children showed a higher prevalence.(11) There have been reports suggesting that the prevalence of myopia in medical students are higher.

In the study by McDonald JA, et al.,(3)about 26.2% of children used screens for more than 2 hours per day.McDonald JA, et al.,(3) also had reported that screen time use was heavier on weekends.

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The current study showed that the family history of myopia was not statistically associated with myopia in children. But in contrast Chua SYL, et al.,(12) and Mutti DO, et al.,(13) reported that the prevalence of myopia was higher among those who had a parent with high myopia.

A positive association between digital screen time and myopia found in the current study was in accordance with previous literatures by Saxena R, et al.,(14) Qian DJ, et al.,(15) Guan H, et al.,(16)Paudel P, et al.,(17)Jones- Jordan LA, et al.,(18). In contrast inconsistent results in the relation between myopia and screentime was reported in studies by Mutti DO, et al.,(13) Chua SYL, et al.,(12) Lu B, et al.,(19) and Ip JM, et al.,(20)

They were on an average using spectacles / contact lens for 5.8 ± 3.1 yrs.

Among those who were diagnosed case of myopia 70 (26%) had a refractory check up within last 1 year and were using power correction lens as per the last check up values.

On this screening about 8 (3%) were newly diagnosed with myopia.

About 39 (14.4%) had progression of myopia in the last 1 year.

Most of the students 164 (60.9%) had at least 1 symptom suggestive of refractory error / progression in refractory error.

The mean duration of screen time among medical students was 10.3 ± 2.8 hours / day.

The average duration of use/ day was highest for Mobile phone screen with a mean duration of 5.4 ± 1.8 hours / day.

5. Conclusion

The study was concluded the prevalence of myopia among medical students was 69.1% and that 14.4% had progression of myopia in a year.The mean duration of screen time among medical students was 10.3 ± 2.8 hours / day and there was a significant association between digital screen time and myopia among medical students.

6. Limitation

Due to limited resources, the current study was done in as a cross sectional study. Hence, causality could not be established in middle of screen time and myopia. All students were not subjected to standard screening for myopia.

7. Recommendation

Students should be made aware about correct screen time and the role of high screen time in myopia. Further research is required in different study settings to find the association between screen time and myopia.

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