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A Prospective Study of Evaluation and Analysis of Myopia and Associated Risk Factors Among People in Health Care Profession at Jamnagar

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Abstract

Introduction: Myopia, a prevalent refractive error commonly termed nearsightedness, represents the foremost cause of global vision impairment. While genetic susceptibility influences myopia development, environmental factors, particularly increased near work exposure as observed in medical students during their studies, are increasingly recognized as potential risk factors for myopia progression.

Aim & objectives: To find out a prevalence of myopia & associated risk factors among 1st year medical & paramedical students in Jamnagar, Gujarat, India.

Methodology: A cross-sectional study surveyed 400 medical and paramedical students via an anonymous Google form questionnaire. Myopia prevalence was then determined through Snellen chart screening and diopter measurement in the ophthalmology department. Data analysis was conducted using Microsoft Excel.

Results: In our study, we observed a total myopia prevalence of 56.75% among medical and paramedical students. Myopia was distributed in medical and paramedical as 127(57.73%) and 100(55.55%) respectively. Other associated risk factors of myopia like paternal history, "B" blood group, age >15 year, reading distance <15 cm, time spent on electronic gadgets >1 hour, etc. have a positive association with myopia in our study.

Conclusion: In Shri M.P. Shah Government medical college, Jamnagar more than 50% medical & paramedical students are suffering from myopia. Age, parental history, spending more time for near work, more using of electronic gadgets, blood group etc. are associated risk factors with myopia.

Keywords: Myopia, Prevalence, Associated risk factors, Medical and paramedical students, India.

Introduction

Myopia is a type of refractive error in which parallel rays of light coming from infinity get focused in front of retina rather than on the retina.[1] In myopia far vision is decreased while near vision is maintained. So myopia is also known as near sightedness. As there is difficulty to see far object in myopia so, there is difficulty in day to day life activities. In India prevalence of myopia was found to be 30%.[2] In Singapore, the prevalence of myopia is one of the highest worldwide, affecting 28% of school children at the beginning of their primary education and 70% of those completing university education.[3]

Myopia is classified as mild myopia, moderate myopia, severe myopia and pathological myopia. Mild and moderate myopia leads to only a change in optical status of the eye, high myopia has been noted as a risk factor for structural complications like rhegmatogenous retinal detachment, muscae volitantes, posterior vitreous detachment, lattice degeneration and myopic maculopathy which in turn can result in irreversible blindness.[4] Pathological myopia results in permanent structural changes in eye. Myopia is correctable by using optical aids such as spectacles and contact lenses or through increasingly popular surgical means. Surgery can be either laser assisted refractive surgery or intraocular phakic lens implantation.[5]

Myopia with associated risk factors should not be neglected, and we need a public health to prevent myopia onset and progression. In several study it was found that genetic factor, environmental factor and higher education also play an important role in greater prevalence of myopia. Other factors like more near work, more time spent in electronic gadgets, etc. may be linked to the development or progression of myopia.

Based on the above study, there have been numerous studies both on myopia prevalence and associated factors. Therefore, we used 400 sample to confirm the prevalence of myopia and factors associated with myopia among 1st year medical and paramedical students.

Materials and Methods

An institution-based, observational, cross-sectional study was conducted at the Department of Physiology, M.P. Shah Government Medical College in Jamnagar, India. The study population consisted of 400 undergraduates 1st year medical and paramedical students who were enrolled in the study if they were between 18 and 22 years old, and willing to participate. Students suffering from eye disorders or not willing to participate were excluded from the study. The study duration was 5 months. The Demographic factors, Environmental factors, Academic factors, Prevalence of myopia etc. were the study variables.

The Institutional Ethical Committee approval was obtained before the initiation of the study. After obtaining ethical clearance, the study population was informed about the purpose and nature of the study. Written consent was obtained from all participants through a Google form and confidentiality and anonymity were ensured throughout the study. Participants were then asked to complete a questionnaire that included multiple-choice questions and short-answer questions. The data was entered into an Excel spreadsheet and analyzed by using Microsoft Excel.

Result

A total 400 students participated in our study out of which 220 were medical students and 180 were

paramedical students. Out of 220 medical students 139 were males and 81 were females and out of 180 paramedical students 47 were male and 133 were females. In our study overall prevalence of myopia and gender based prevalence of myopia are summarized in table 1 and table 2 respectively.

Table 1: Prevalence of Myopia

Parameters	Medical (N=220)	Paramedical (N=180)	Total (N=400)
Myopic	127 (57.73%)	100 (55.55%)	227 (56.75%)
Non myopic	93 (42.27%)	80 (44.45%)	173 (43.25%)

Table 2: Gender Based Prevalence of Myopia

Gender	Medical Myopic (N=127)	Paramedical Myopic (N=100)
Male	77 (60.63%)	20 (20%)
Female	50 (39.37%)	80 (80%)

Table 3 reveals that 26.87% of myopic students have at least one myopic parent, while 14.10% have both parents with myopia. These findings indicate a positive relation between family history and myopia, suggesting that individuals with myopic parents are more likely to develop myopia themselves.

Table 3: Role of Family History in Prevalence of Myopia

Family History	Myopic (N=227)
One parent	61 (26.87%)
Both parent	32 (14.10%)
None	134 (59.03%)

In our study we also found that B blood group is more prevalent in medical and paramedical myopic students and comparison with other blood group is shown in Table 4.

Table 4: Distribution of Blood Group Among Myopic and Non Myopic

Blood Group	Myopic (N=227)	Non Myopic (N=173)
A	43 (18.94%)	46 (26.59%)
B	79 (34.80%)	47 (27.17%)
AB	20 (8.81%)	15 (8.67%)
O	68 (29.96%)	48 (27.75%)
Not Known	17 (7.49%)	17 (9.83%)

In our study most of students were diagnosed with myopia after the age of 15 years. Other age group with myopia diagnostic age summarized in table 5.

Table 5: Distribution of Myopia Diagnostic Age

Myopia Diagnosed Age	Myopic (N=227)
< 5 Year	6 (2.64%)
5-10 Year	23 (10.13%)

10-15 Year	74 (32.60%)
>15 Year	124 (54.63%)

Out of 227 myopic students -0.5 to -1.75 diopter was found in 88 (38.77%), -2.0 to -2.75 diopter was found in 58(25.55%), -3.0 to -3.75 diopter was found in 50(22.03%), -4.0 to -4.75 diopter was found in 4(1.76%) and >-5.00 diopter was found in 27(11.89%) medical and paramedical myopic students. So, most of myopic students have -0.5 to -1.75 diopter. Diopters with number of myopic students are summarized in below table 6.

Table 6: Prevalence of Degree/ Severity of Myopia

Diopter	Myopic (N=227)
-0.5 to -1.75	88 (38.77%)
-2.0 to -2.75	58 (25.55%)
-3.0 to -3.75	50 (22.03%)
-4.0 to- 4.75	04 (1.76%)
> -5.00	27 (11.89%)

Table 7: Role of Associated Risk Factors in Myopic and Non Myopic

Associated Risk Factors	Myopic (56.75%)	Non Myopic (43.25%)
<15 cm Distance maintain while reading a printed material	14.10%	12.72%
>1 hour time spent on electronic gadgets	83.70%	79.77%
Myopia worsened in past 1 year	42.30%	*******
Wearing of contact lens	19.82%	0.58%

Discussion

The findings of this study reveal the myopia prevalence amongst the medical and paramedical students. Our study also suggest association with gender, with reading distance or with time spent on electronic devices. We also found that a number of medical students were not aware of being myopic and hence were diagnosed of having myopia at the time of our study.

According to the report by world health organization, uncorrected refractive error is the second commonest cause of global visual impairment next only to cataract.[6]

In our study, among medical & paramedical students total 56.75% are myopic and 43.25% are non-myopic. Prevalence of myopia among medical students is 57.73% & Prevalence of myopia among paramedical students is 55.55%. So there is not a major difference of myopia in medical and paramedical students.

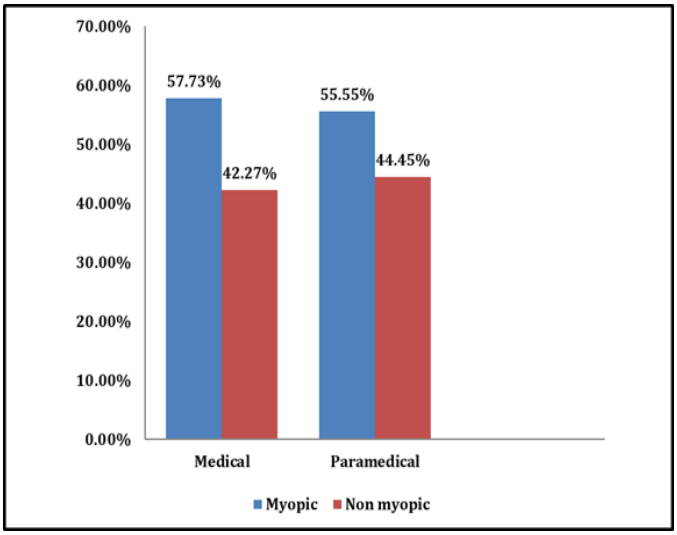

Figure 1: Prevalence of Myopia and Non-Myopia Among Medical and Paramedical Students

There are some studies which have been conducted across the world and there is huge variations in their results. Myopia has been found to be as high as 87.5% in hongkong, 82% in Singapore, Taiwan where prevalence was found to be 92.8% which had increased to 95.8% over a short time of just five years .[7,8,9] Whereas, a prevalence of only 57.6% was found in Lahore and 50.3% in Norway.[10,11]

In this study prevalence of myopia is more in medical male students (60.63%) as compare to female medical students (39.37%) while Algorinees et al. found that the prevalence of myopia is less in medical male students (51.80%) as compare to female medical students (57%).[12]

In our study there is no strong evidence of association of myopia with parental history. In this study, 26.87% of total myopic students had atleast one parent with myopia, and 14.10% had both parent with myopia, while 59.03% had no myopia in both parent**.** Sidra Fatima Naqvi et al. observe in their study that 62.6% of total students had at least one parent with a refractive error and 69.4% of students having low visual acuity had at least one parent with a refractive error which was found to be significant with p value 0.023.[13]

Some disease are more common in certain blood groups; in our study myopia is found more prevalent in "B" blood group which is 34.80%. While Shazo Sana et al. found in their study that the highest frequency of myopia was seen in "O" blood group which is 49%. [14]

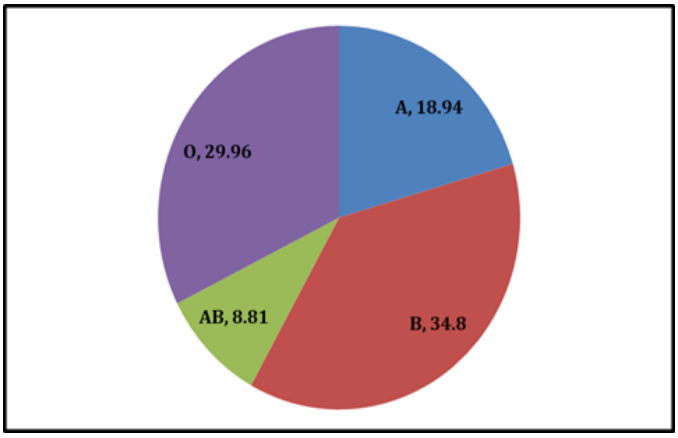

Figure 2: Prevalence of Different Blood Groups in a Myopic Population

Majority of the mopics (38.77%) in this study showed lens Power between -0.5 to -1.75 D. This was in agreement with Chalsani et al who found that increased percentage of myopics had lens power <2.00D. [15]

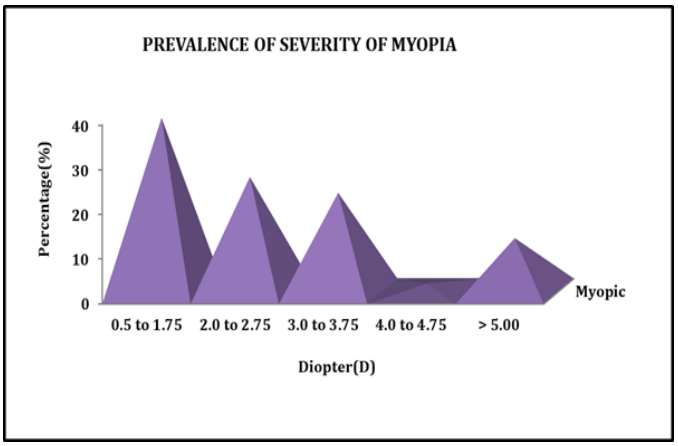

Figure 3: Prevalence of Myopia Severity Among Study Participants

In this study figure 4 presents the distribution of myopia diagnostic age among a study population. It is a bar graph illustrating the percentage of individuals diagnosed with myopia at different age ranges. The categories include <5 years, 5-10 years, 10-15 years, and >15 years. The figure shows a clear trend where the percentage of individuals diagnosed with myopia increases with age, with the highest percentage falling in the >15 years category.

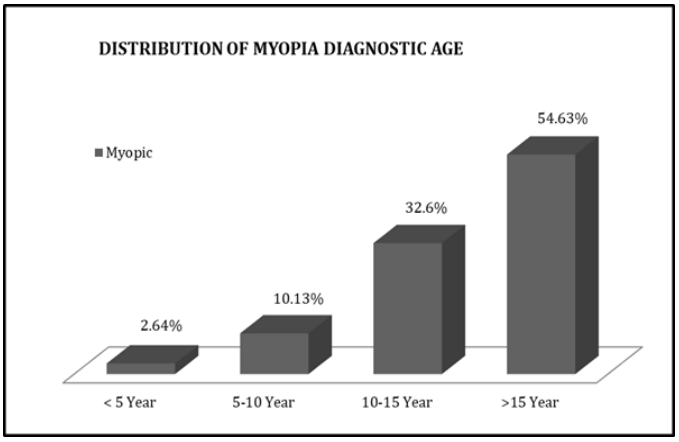

Figure 4: Showing the Distribution of Myopia Diagnostic Age

In our study we found that 83.70% myopic students are highly associated with use of electronic gadgets such as smart Phones, tablets, laptops and computers. This type of observation was also seen with the findings of Reddy et al. who found that more than 2 hours continuous use of computer was significantly associated with occurrence of symptoms of computer vision syndrome.[16] Our study showed that the maximum reading distance was < 15 cm (near work) in myopic students are 14.10%. But Naila et al. Found in their study that < 15 cm reading distance in myopic students was 60.9%.[17]

As Dey et al. who found that long and rigorous study schedule of average 5 to 6 years predisposed the medical students for higher rate of refractive errors especially myopia.[18] so, we are planning for further study on these students when they reach to internship to find out where long study hours and vast syllabus affect prevalence of myopia.

Conclusion

A high prevalence of myopia (56.75%) was found among first-year medical and paramedical students in Jamnagar, India. Factors such as age, family history, blood group, near work, and excessive electronic gadget use were associated with an increased risk of myopia. Notably, the study suggests a strong correlation between near work and electronic gadget usage and the development of myopia among these students. Further research is necessary to definitively establish causal relationships and develop effective preventive measures.

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