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ORIGINAL ARTICLE

Prevalence and Risk Factors of Myopia among Medical students

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ABSTRACT

Aim: To access the prevalence and investigate the contributing risk factors of myopia in M.B.B.S students impacted by medical school lifestyle practices

Methodology: A cross-sectional study was conducted for a period of two months between September and October of 2020, among the students of Services Institute of Medical Sciences, Lahore, Pakistan. Data was collected by using questionnaires from medical students. IRB approval was granted. Descriptive analysis was done using the research tool SPSS 25.

Results: Out of 110 medical students, majority were male and 83.6% were myopic. Off which, 56.4% had a refractive error less than -3.00 D, 22.7% had a refractive error between -3.00 D to -6.00 D and 1.8% above -6.00 D. About 61.8% students had the onset of myopia in their adult age, while 23.6% since childhood. 54 students have a myopic familial history. Students spent most of their time doing near work like studying with 58.2% students reported use of digital devices (also at night). Most of the students wear prescription glasses, with 67.3% use it while writing. About 73.6% students do not take rest after doing work. About 70% students do not do any hourly outdoor exercise. Only 12.7 % of the students have an intake of vitamin A supplements. 97 % students do not have any history of ocular trauma, ocular surgery and laser treatment.

Conclusion: Proper measures need to be taken by health authorities and medical college's student affairs department to guide the students on how to improve heathy eye hygiene and routines. Regular ocular checkups should also be encouraged. It is recommended for students to study in good light, take proper rest, reduce their nutritional deficiencies and most importantly limit their screen time, especially at night. Health education programmers and medical education policy makers should be involved to ensure the implementation of frameworks that facilitate the control of risk factors of myopia amongst medical students.

Keywords: Medical students, Myopia, Near work, Screen time.

INTRODUCTION

Myopia is widely recognized as a significant health lifestyle concern, resulting in decreased vision and is a risk factor for other ocular conditions[1]. It is a type of refractive error that causes distant objects to appear blurred while near objects are clear. Clinically, myopia is defined as a spherical equivalent objective error of ≤ -0.5[2] It is estimated that 1.4 billion people were myopic in 2000, and it is predicted that by 2050, it will increase to 4.8 billion.[3] Socioeconomically, refractive errors, particularly if uncorrected, can affect school performance, limit employment and impair quality of life. Myopia is known to be associated with several ocular complications such as retinal detachment, glaucoma, cataract, optic disc changes and maculopathy[4].

High prevalence rates pose a major public health challenge due to visual impairment. Regarding environmental risks for myopia, prolonged near work, intensive education, and limited time spent outdoors are strongly suggested.[5] For instance, a study reported that young with a greater reading exposure were more likely to be myopic with screen-based devices, e.g., tablets, smartphones, televisions, laptops and computers. As these modalities are more accessible nowadays, children are easily exposed to electronic screens at a very young age[6]. It was reported that approximately 68% of the youth, use screen media on a daily basis. A study in India showed that excessive screen time was associated with myopia in school-aged children.[7] Another study of school-age children in northwest Ethiopia demonstrated that watching television from less than 2 m, and mobile exposure for more than 4 hours per day were significant risk factors for myopia[8].

A national survey in Pakistan found the crude prevalence of myopia to be 36.5%[9]. However, studies regarding myopic risk factors despite the rising high prevalence in Pakistan is insufficient. Adequate timely action to control and limit its menacing impacts for the near future is the need of the hour especially in this digital age. Thus, for effective prompt preventive management, it is essential to assess the risk factors for myopia in young adults and address measures for control.

The objective of the study was to access the prevalence and investigate the contributing risk factors of myopia in M.B.B.S students impacted by medical school lifestyle practices

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METHODOLOGY

A cross sectional study was conducted after permission from IRB for a period of two months between September and October of 2020, among 110 medical students (M.B.B.S students) of Services Institute of Medical Sciences, Lahore, Pakistan. All students having myopia, willing and cooperative to participate, were included in the study. Operational definitions were set by variable measurement and myopia was classified into three categories: Low grade myopia, medium grade myopia and High-grade myopia. Data was collected using a self-developed, close ended, pre-tested, structured questionnaire which was developed in accordance with the study objectives. Ethical considerations were kept in view with the IRB approval granted. Data was collected using the semi-structured questionnaire with non-probability convenient sampling technique. Data was analysed using SPSS version 25. Data was presented using bar chart and pie graphs. We used Chi-square test as the test of significance. P-value < 0.05 was taken as significant.

RESULTS

The study was conducted on medical students. There were more male students than female students. The majority age group was below the age of 22 years and 35% were above the age of 22 years. Students from all five years of M.B.B.S were a part of this study, with maximum participation from 4th year medical students. Among all students, 64.5% were hostelites and the rest were day

scholars. Only 1.8% was married, while other's marital status was either single or undeclared. 19% of the students were from rural areas and 81% were from urban areas. As for socioeconomic status (SES), majority belonged to middle SES, while 6.4% belonged to a high SES and 1.8% from low SES (Table 1). Among all the students, 16.4% were not myopic, while a majority of 83.6% were myopic. (Figure 1). Admits them, only 19.1% had no refractive error. Others having refractive errors were categorized into three with; 56.4% having an error below -3.00, 22.7% between -3.00—6.00 and 1.8% above -6.00. (Table 2) About 61.8% students had the incidence of myopia in their adult age and 23.6% since their childhood. 54 students have a myopic familial history. Students spent most of their time doing near work, using mobile phone, laptop and tablets. 58.2% students used the devices at night. Most of the students use prescription glasses with their use seen to be 67.3% while writing. Whereas 32.7% used no glasses. About 73.6% students do not take rest after doing work. About 70% students do not do any hourly outdoor exercise. Most of the students are not taking any supplements, with only 12.7% reported an intake of Vitamin A supplementation. 97% students do not have any history of ocular trauma, ocular surgery and laser treatment. Only 3 students have had laser treatment.

Table 1: Descriptive Demographics

Variables	***f(%)***
Gender	
Male	54%
Female	46%
Age	
Above 22 years of age	35%
Below 22 years of age	65%
Designation	
1st year students	20%
2nd year students	9%
3rd year students	16%
4th year students	43%
5th year students	11%
Day scholars	35.5%
Hostelites	64.5%
Marital status	
Married	1.8%
Single/ Undeclared	98.2%
Residence	
Rural Area	19%
Urban Area	81%
Socioeconomic status (SES)	
Low SES	1.8%
Middle SES	91.8%
High SES	6.4%

Figure 1: The prevalence of Myopia in Medical Students

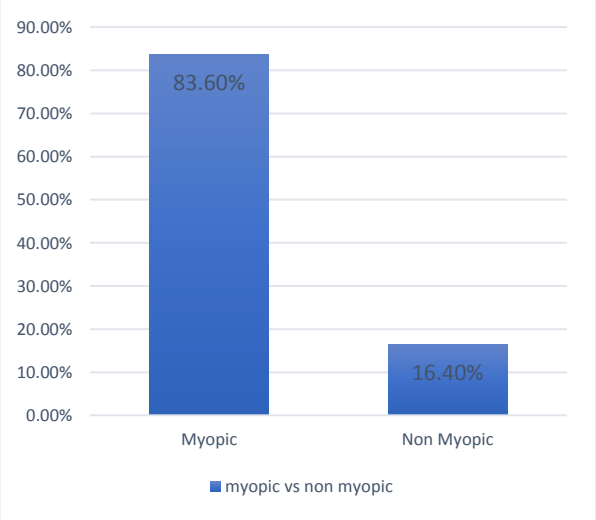

Table 2: Frequency of Refractive Errors

Refractive Errors	***f (%)***
No refractive error	19.1%
Having refractive error:	
below -3.00	56.4%
between -3.00 to 6.00	22.7%
above -6.00	1.8%
Total	80.9%

DISCUSSION

The study was conducted amongst medical students, who are relatively more exposed to perform near work activities in comparison to other students.[10] The majority of the students had myopia with refractive errors. About 61.8% students developed myopia in their adult age, while 23.6% had it since childhood. Similar studies among medical students in Saudi Arabia, United Kingdom, Norway and Denmark yielded prevalence rates of 57.9%, 55.5%, 50.3% and 50%, respectively. [11, 12, 13,14] It is possible that the difference in myopia prevalence rates across different countries may be attributable to ethnic variations, different environmental factors and genetic predispositions.[15] The prevalence of myopia in this study, was reported to be 83.6%, which reflects a high prevalence of myopia among Pakistani medical students. Our study showed that the association of family history is not significant as p value was found to be greater than 0.05. However, another study in Lahore showed that 60.7% had a positive family history.[16] Difference of results could be due to varied sample size and type of population. Our study showed that highest age group affected by myopia is from 20 -24 years (47.3%). However, a study conducted in 16 Asian countries showed high prevalence of myopia in Korean aged 19 years (96%) and comparatively high in 70 years of age due to cataract formation[10,16].

Prescription glasses use was seen to be 67.3% while writing, while 32.7% used no glasses. This shows a significant relationship. A study in Nigeria showed that 79.5% students have a form of refractive error among which only (12.1%) wore glasses while writing[13].

In our study we found that time spend on laptops or phones and other smart screens is not statistically significant. About 63.4% spend 2 to 6 hours and less than one hour is spent by only 4.5%. A study conducted in Taiwan showed progression of myopia by spending more time on smart screens[17,18].

In Singapore, a study on teenage children showed association between myopia and outdoor activities. [13] The total time that was spent in outdoor activities was related with decrease risk of occurrence of myopia. This is also supported by Australian data[19,20]. However, in our study, no association was found between outdoor activities and myopia.

Vitamin A supplementation was taken only by 12.7% of the study subjects. Hence, no association was found between the occurrence of myopia and vitamin A supplement intake. This is in accordance with another research conducted which showed that although people with vitamin A intake are less likely to be myopic but it is not statistically significant with myopia[10]. This might be due to genetic differences along with variations of age, gender and ethnicity. Our study shows that the ages affected most are between 20 to 24 years. Moreover, though the prevalence of myopia is seen in both genders, in this study sample despite having more male medical students, still more females were seen to be affected with myopia.

Changing student's life styles in this digital era requires awareness through mass media to minimize the use of mobile phones and also to study in proper light and at a proper distance. Guidelines and proper legislative frameworks by medial education policy makers can also play a pertinent role towards improving practice patterns. It is recommended that screen-time should be limited and out-door activities should be encouraged.[20] Healthy Eye-care habits should be incorporated in daily routines. This includes, adequate lighting in the room, holding books about

30cms away from the eyes while reading, keeping monitor screens 50cms away from the eyes and sitting upright in a comfortable chair while doing near work.[17-20] Routine eye check-ups are recommended for early diagnosis and prompt treatment. Healthy lifestyle should be adapted which includes an 8-hour sleep and taking a balanced diet including green leafy vegetables, carrots and fish[21]. More studies should be conducted to have a better understanding about the possible causes of myopia and how they can be prevented. In addition, more health education programmes should be conducted to create awareness among general public with full community participation and intersectoral coordination should be ensured.

Limitations: Due to restrictions and protocols of the covid-19 pandemic there was less time on campus to circulate and get in person questionaries filled. The study was unable to sub-stratify the degree of myopia and correlate it with different groups (those with positive family history, those with other causes of myopia and those with accompanying other diseases/complications e.g., retinal involvements). This study was conducted in a single centre with a small sample size. Hence, the conclusions and recommendations should be comprehended within this context, as they might not be applicable to other groups or general population.

CONCLUSION

High prevalence of myopia is seen in medical students, more with an adult age onset (suggestive of pre-med education years and during medical school). This is because of increased near work which includes studying mainly at night and lack of proper rest after studying, along with lack of intake of any vitamin A supplements. Nutritional deficiencies in medical students are also an important risk factor which is seen mostly in hostilities. Many eat fast foods or dietary products concentrated in saturated fatty acids. Students spend very less time on outdoor activities like sports or exercise, which significantly affect the health of the muscles of the body. They used to spend more time on digital devices such as computer, laptop, phone and on tablets, especially at night. Most of the students do not have any history of ocular trauma, ocular surgery and laser treatment. Therefore, there should be an intervention of proper measures taken by health authorities and student affairs departments of medical colleges to guide the students on how to control the incidence of myopia. It is essential to guide the students to study in good light, take proper rest, reduce their nutritional deficiencies and most importantly limit their screen time, especially at night. Once guidelines have been incorporated into the curriculum practices, it is equally important to also ensure students are maintaining them. Hence, it is vital to involve health education programmers and medical education policy makers.

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