

Prevalence of Myopia and Assessment of Perceptions of its Associated Risk Factors Among Medical Students in Rawalpindi

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ABSTRACT

Objective: To determine the prevalence of myopia among medical students and to assess the perception about the accompanying risk factors.

Study Design: Descriptive Cross Sectional.

Place and Duration of Study: Study was conducted among medical students of Rawalpindi Pakistan, over a time span of 6 months, from Dec 2021 to May 2022.

Methodology: Students participating in this study were belonging to both the genders with ages between 17-25 years. Students having history of LASIK surgery were excluded. A Pre-tested structured questionnaire was used for data collection and was distributed among students via Google Forms through various social media platforms. Analysis was done on SPSS version 26.

Results: A total of 300 students participated in this study, including 211(67%) females and 99(33%) males. About 150(50%) of the participants had myopia and 35(11.7%) of these had myopia since childhood. Among the myopes, 39(26%) were the ones whose parents had myopia and 98(65%) were the ones whose siblings had myopia too. Only 60(21%) students were aware of the risk factors such as increased mobile usage, reading in dim light, not wearing recommended glasses, sitting too close to TV screen. No statistically significant association was found between myopia and time spent on screen ($p=0.333$).

Conclusion: Myopia is widespread among medical students. Family history and genetics are linked to myopia. Time spent outdoors is very much less as compared to the time spent in front of screens by the students. A substantial proportion of students do not appear to be aware of current concepts and the actual risk factors leading to myopia.

Keywords: Myopia, Prevalence, Risk factors.

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INTRODUCTION

Myopia has become a major emerging health concern as a consequence of the alarming rate of its increasing prevalence. Myopia is defined as per the guidelines of World Health Organization as “a condition in which the spherical equivalent objective refractive error is <-0.50 diopter (-0.50 D) in either eye”. Approximately 5 billion people (almost half of the world’s population), are predicted to be myopic by the end of the year 2050.¹ The prevalence of myopia in Asia is rising in particular,² such that every 8 out of 10 Asians are suffering from myopia.³ As per findings of national blindness and visual impairment survey 2016, prevalence of myopia is 36% in adult population of Pakistan.⁴ Among numerous other factors that are linked to the development of myopia, the highest correlation with greater prevalence of myopia is found out to be with that of higher education.⁵ Children whose parents were having a history of myopia had

greater incidence of myopia.⁶ However only a few studies associate increasing incidence of myopia to increased screen device usage too.⁷ It is important because high myopia is linked with several other progressive ocular abnormalities i.e. cataract, glaucoma, retinal detachment, visual impairment and blindness and uncorrected myopia is the leading cause of preventable blindness.⁸

Medical students of any developing country are believed to be an academically proficient population and are considered to be a bright source for the country’s resources in the future, but with the alarming increase in incidence of myopia in this very population, they could prove to be a burden for the economy. Raising awareness among medical students as well as public is the need of the hour to prevent development and progression of myopia. Lifestyle modifications are considered to be the most important means for ophthalmologists in the control of progression of myopia,⁹ hence, there is a great importance of awareness regarding myopia risk factors among the medical students, as it will aid in its

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prevention as well as planning of public health strategy regarding myopia.¹⁰

This study was conducted with an aim of determining the prevalence of myopia in the medical students of Rawalpindi along with the knowledge of its accompanying risk factors, given that awareness of the risk factors is an essential protagonist in the primary prevention of myopic conditions, and control of its further progression.

METHODOLOGY

It was a descriptive cross-sectional study conducted at public sector medical colleges of Rawalpindi, from December 2021 to May 2022. Sample size was calculated to be 300 medical students using Epi info sample size calculator with margin of error as 5% and CI of 95%. Using convenience sampling technique, forms were distributed among the students.

Inclusion Criteria: Students of both the genders, between the age group of 17-25 years, belonging to both rural and urban backgrounds were included in this study. Students, studying either in MBBS or BDS, were included.

Exclusion Criteria: Students who had undergone LASIK surgery were excluded from the study.

A pre-tested structured questionnaire was used to collect data via Google forms, the link of which was shared among the students through various social media platforms. The questionnaire comprised of the questions to assess general knowledge regarding myopia and its risk factors, as well as the daily time expenditure of students on various platforms in various activities. The questionnaire has two sections: First section to be filled by all the students whether myopic or non myopic, and contained demographic details, family history, risk factors and daily time expenditure of students. Second section for the students having myopia, about the progression and use of control measures.

The questionnaire was scored on a binary scale as Yes and No. Statistical analysis was done using SPSS version 26 and the frequencies and percentages for each variable were calculated. Ethical approval was obtained from ERC of AMC. Ethical considerations were followed according to the recommendations of ethical review board, including informed consent for a voluntary unpaid participation in study while ensuring confidentiality and privacy of their response.

RESULTS

A total of 300 students participated in this study which included 211(67%) females and 99(33%) males.

The mean age of the students was 21 ± 1.5 . Among the participants, 150(50%) students had myopia. 35(11.7%) participants had myopia since childhood and 69(23%) of them had progressive myopia. 201(67.3%) participants were aware of the control measures to prevent progression of myopia while only 145(48.3%) of them practically adopted those measures.

There was a greater incidence of myopia in the siblings of the individuals who were myopic as compared to the siblings of non myopic individuals. According to the findings of this study, among non myopic students, only 35(23%) students had their siblings suffering from myopia. However, among myopic students, 98(65%) students were having their siblings who were suffering from myopia. No statistically significant association was found between myopia and time spent on screen ($p=0.333$) after applying chi square test of independence (Figure).

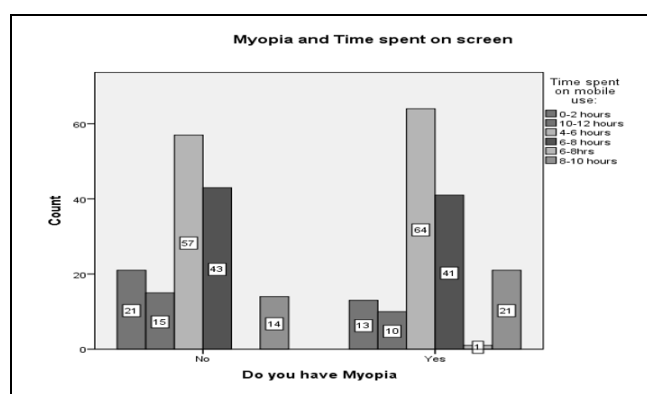


Figure: Myopia and Screen time

Regarding the perception of risk factors that could lead to myopia, the results were quite astonishing. A vast majority of the students, 242(80.6%), had the perception that increased screen devices time was the major risk factor leading to myopia. 224(74.6%) were of the opinion that reading in dim light was causing myopia. 218(72.6%) believed that sitting too close to TV screen was another risk factor in causing myopia while only 63(21%) students were of the view that not enough sunlight exposure was associated with the prevalence of myopia (Table).

DISCUSSION

The result of this study approximates that more than half of the participants were myopic and majority of them were females. A definite family history, with either one or both parents affected, was found in most of those who had myopia. Screen device usage, study habits and modes of study were listed among the

several risk factors causing myopia, as perceived by the students. Students considered outdoor activities to have an important positive impact on preventing the development and progression of myopia. Majority of the students were aware of the risk factors such as reading in dim light, more study hours, not wearing recommended glasses, etc. Most implemented precautionary measures, however, the prevalence was higher than anticipated, which indicates the interplay of various genetic and hereditary factors.

Table: Perception of Medical Students Regarding Risk Factors of Myopia

| Risk Factors | No. of Students with Perception of these Risk Factors | Males | Females |
|--------------------------------|---|-------|---------|
| Increased Mobile usage | 242(80.6%) | 77 | 165 |
| Reading in dim light | 224(74.6%) | 70 | 154 |
| Sitting too Close to TV Screen | 218(72.6%) | 70 | 148 |
| Not enough sunlight exposure | 63(21%) | 27 | 36 |

Most of the students held the belief that screen time and electronic usage is correlated with a greater incidence of near sightedness, an opinion that is contrary to previous studies already conducted on association of myopia with screen device usage. In a study performed on development of Myopia in childhood in 2020, results showed environmental considerations do play an essential part in the development of myopia, however, there is still inadequate evidence as to whether smart device use is a risk factor.¹¹ In a similar study conducted in Rawalpindi in 2021, around half of the medical students were found to be myopic and there was no substantial effect of screen exposure time or study hours on myopia indicating that myopia is more widespread in students with family history it.¹²

In a study carried out on the medical students of Dow University of Health Sciences, Karachi Pakistan in 2021, half of the participants were found out to be myopic. Age, gender and family history was significantly associated with myopia in correspondence with the results of this study. However, other factors like use of computer, mobile phones and studying late at night were not significant.¹³ In another study conducted in 2020, there's no association between screen time and myopia prevalence, incidence and progression.¹⁴ However, associations between screen time and myopia have not been consistently reported in most studies,^{15,16} which implies that in our study, most of the participants had an incorrectly held notion when it

comes to electronics. Research with objective measures of screen time and myopia-related consequences that investigates smart device exposure as an independent risk factor is still required.

A previous study in Singapore in 2017 found out that the prevalence of myopia has seen a more rapid increase in the individuals that started elementary school after the 1980's. Digital screen devices were introduced much later in time, showing that other factors, apart from screen devices are responsible for increase in myopic persons. Digital screen time may not be a cause, but it may be a replacement for other forms of indoor work. According to earlier research, youngsters who engage in more indoor work while spending less time outside are more likely to develop myopia.^{17,18}

According to recent research, children and adolescents who spend a lot of time using digital screens may have a higher risk of developing myopia.^{19,20} First off, the advent of mobile devices in recent decades has led to an increase in digital screen time. Given the contradictory results, the effect of screen time on myopia has to be further assessed. In urban Pakistan, myopia frequency rose mostly with rising education a few decades ago, not more recently along with screen usage. It is crucial to understand if using digital screen devices exposes people to myopia and myopia development in myopic and high myopic populations. Further research employing unbiased screen time assessments is necessary given the increase in the number of hours kids spend using screens.

LIMITATIONS OF STUDY

Data was collected from medical students of Rawalpindi Pakistan only, therefore it cannot be generalized to all the students. As forms were distributed via Google forms, availability of internet services as well as the lack of interest of students to participate was a limitation to this study.

CONCLUSION

Myopia is very prevalent in medical students. Family history and genetics are primarily associated with myopia. Time spent by students in outdoors is very less as compared to the time they spend in front of screen devices. Majority of the students think that the Screen device usage is the sole factor in causing myopia as most of the study pattern has been shifted to Electronic Media and they have to use screen devices more often for study purposes. However, there is no truth/evidence to that and a substantial proportion of students do not appear to be aware of current concepts and the actual risk factors leading to myopia due to lack of awareness. Electronic, Print and social media can be used to make students aware about the risk factors associated with myopia. Seminars need be arranged to raise awareness and

to reinforce the necessity of usage of recommended glasses for myopia. Awareness regarding outside exposure can be made among the students by encouraging extra-curricular activities at school, college and university level. For the purpose of guiding parenting, education, clinical practise recommendations, and public health policy, it will be critical to have a better knowledge of the relationship between myopia and digital screen exposure.

Conflict of Interest: None.

Author’s Contribution

Following authors have made substantial contributions to the manuscript as under:

MAR: Data analysis plan, Manuscript Review, Technical support & approval for the final version to be published.

SFM: Conception of Idea, Study design, Literature review, Data analysis plan, Result, Manuscript review, Technical support & approval for the final version to be published.

SW: Statistical analysis, Referencing, Introduction, Discussion, Result, Literature review & approval for the final version to be published.

AA: Abstract, Introduction, Result, Discussion, Conclusion, Literature review & approval for the final version to be published.

ZJ: Introduction, Discussion, Limitation & approval for the final version to be published.

KBT: Results, Discussion, Manuscript review & approval for the final version to be published.

HA: Data collection, Questionnaire, Results compilation & approval for the final version to be published.

FM: Data collection, Data analysis, Write up & approval for the final version to be published.

SJ: Data entry, Write up & approval for the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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