

PREVALENCE OF REFRACTIVE ERRORS AMONG 4TH YEAR MEDICAL STUDENTS OF D.G. KHAN MEDICAL COLLEGE, DERA GHAZI KHAN, PUNJAB, PAKISTAN

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ABSTRACT

Background: Refractive error is a very common eye disorder which occurs when the eye cannot clearly focus outside world images ending up with blurred vision but timely detection and intervention can enormously enhance student's potential during his or her formative years. Medical student's Refractive status is of immense importance considering the burden of medical studies and their role as future health care providers.

Objective: To assess the Prevalence of Refractive errors amongst 4th Year Medical students of D.G. Khan Medical College.

Methods: This cross-sectional comparative study was conducted amongst 80 fourth year MBBS students fulfilling the inclusion criterion and who gave consent for the study after ethical clearance. Study was conducted at DG Khan Medical College and Ophthalmology Department; Teaching Hospital DG Khan and duration was six months.

Results: Students Age group was from 20 to 26 years, with mean value of 22.49 and median and mode coincide with a value of 22 years. Female students were 54/80(67.5%) with 34/54(62.96%) having Refractive errors while Males were 26/80(32.5%) with only 9/26(34.61%) were having refractive Errors. Myopic were 42/80 (52.5%) out of which 2/42(4.76 %) also had Astigmatism while 1/80 (1.25%) had Hyperopia. Severe Myopic were 3.0/80 (3.8%) in both right and left eyes while 10/80 (12.5%) and 11/80(13.8%) fall in moderate category in right and left eyes respectively. Mild were 29/80 (36.3%) right eye while 28/80(35.0%) were left eye Myopics. Only 2.0/80(2.5%) were having Astigmatism in both eyes along with mild Myopia. Significant association found between Age, sex and family history of medical students with the Refractive errors.

Conclusion: High Refractive Errors prevalence especially Myopia among female MBBS students tends to be alarming. It demands implementation of more structured student awareness campaigns focusing genetic factors to help prevent and control more cases of eye defect among medical students, society and Nation at large. Future study can be focused on causes of high Refractive Errors among female medical students.

Key Words: Refractive Error, Myopia, Hypermetropia, Astigmatism and Medical Students.

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INTRODUCTION

Refractive error is a very common eye disorder in which the eyes cannot clearly focus outside world images ending up with blurred vision. Myopia or nearsightedness, Hypermetropia or farsightedness and Astigmatism are common refractive problems.¹ Myopic experiences difficulty in seeing distant objects clearly. Myopia is most common amongst eye defects. It occurs when parallel light focuses in front of the retina due to elongated eyeballs² and

is usually corrected by a diverging lens. Hypermetropes have difficulty in seeing close objects clearly³ when the eyeball is shortened making parallel light focus behind the retina⁴ and is mostly fixed by a converging lens. In Astigmatism vision becomes distorted due to an irregularly curved cornea; the clear covering of the eyeball mostly fixed by a cylindrical lens.^{5,6} Studies reveal that 32.4 million people are blind and 191 million people worldwide suffer from moderate to severe visual impairment out of which 80% are avoidable.⁷ Major cause of visual loss in Pakistan is refractive errors.⁸ Reports have shown that eye defects particularly Myopia tends to be on the increase globally. A study conducted among 115 medical students in Kathmandu has shown that 60 (52.17%) students had refractive errors with female students affected more comparative to male students.⁹ According to a Study conducted among medical students in Dominica 49.5% were having problem, with 30.5% having Myopia, 12.0% Hypermetropia, 33.5% astigmatism and 3.0% were color blind. A higher proportion of refractive error observed in female medical students, 51.6%.¹⁰ Refractive error among medical student of Era's Lucknow Medical College remained 54%.¹¹ A study conducted among MBBS students from Pakistan 203/300 (67.77%) had Refractive errors with highest reported 111/300(37%) having Myopia followed by 71/300 (23.7%) having Hypermetropia and 21/300(7.0%) students were having astigmatism. Females were affected more comparative to males with 72.9% prevalence. And has also shown Significant association between presence of refractive errors and positive family history.¹² Major sufferers of this disease are academically active professionals¹³ coming into contact with technology the most in their day to-day activities and also spend long hours reading and doing near work.¹⁴ The causes of refractive error such as Nutrition, Genetic factor, Lifestyle are common. But the use of electronic devices e.g. mobile, computer, are also considered as predisposing causes of refractive error. Electronic gadgets are being used regularly by all institutions, universities, colleges, agencies and homes for various day-to-day activities.¹⁵ It has been observed that daily use of computer for three hours causes vision syndrome.¹⁶ Higher level of learning at university especially amongst medical students demands more on-screen time.¹⁷ Refractive errors can end up in blurred vision which may lead to visual impairment, the second commonest cause of global visual impairment. Uncorrected refractive error.⁵ If remained Uncorrected can adversely affect learning and academics¹⁸ especially in younger age group. Student's potential during his or her formative years can be improved by timely detection and intervention for correction of these errors.⁶ Medical student's Refractive status is of immense importance considering the burden of medical studies and their role as future health care providers. The current study has been designed to assess the Refractive errors Prevalence

among 4th Year MBBS Students of DG Khan Medical College.

METHODS

It was cross sectional comparative study conducted at DG Khan Medical College and Ophthalmology Department, DHQ Teaching Hospital DG Khan. Its duration was six months after ethical clearance. Study Population was 4th year MBBS students (100). Sample size turns out to be 80 with proportion of 54% proportion and 5% margin of error adjusted on that particular population. Simple Random Sampling was done. Data Collection Instrument was self-developed validated questionnaire. Information was gathered from 80 students of 4th year on a structured Performa after consent. Questions asked were related to Demographics , their family history of Refractive Errors, time spent in reading books and where do they spend their extra times either in playing computer games or outdoor games? Students were examined to find out their refractive errors myopia, Hypermetropia and astigmatism. To find out refractive error of myopia each student was asked to read Snellen's chart at distance of 6m. Students who were unable to read all Chart's lines were sent to find out power of myopia by automated auto refractor to OPD of eye Department of Teaching Hospital, Dera Ghazi Khan. To find out Hypermetropia each student was asked to read Snellen's near chart at distance of 25cm. Students who were unable to read all chart's line, sent to find out power of Hypermetropia by automated auto refractor to OPD of eye Department of Teaching Hospital, D.G Khan. To find out refractive error of Astigmatism each student was asked to stand 3feet away from astigmatic fan test screen and asked to cover their left eye with their left hand and looked closely at the image, then repeated the same with right eye. Students reporting blurred line on astigmatic fan test screen were examined for power of Astigmatism by auto refractor machine. Severity of Myopia, Hyperopia and Astigmatism categorized from Mild to severe (American Academy of Ophthalmology) table 1. Data entry was done on SPSS version 23. Demographic variables, Age wise Prevalence, Severity and Comparison of students with and without any refractive error presented using frequency tables. Sex wise Prevalence of Refractive Errors presented using bar charts. Chi-square test of significance with a P-value ≤0.05 applied to see the relation between different variables.

Table 1: Severity of Myopia, Hyperopia and Astigmatism

Myopia	Mild	Moderate	Sever	
	<-3.00 D	-3.00 to -6.00 D	>-6.00 D	
Hyperopia	Mild	Moderate	Severe	
	≤+2.00 D	+2.00 to +5.00 D	>+5.25 D	
Astigmatism	Mild	Moderate	Severe	Extreme
	<1.00 D	1.00 to 2.00 D	2.00 to 3.00D	>3.00D

Operational definition: Refractive Errors: The eye fails to clearly focus outside world images ending up with blurred vision.¹ It includes Myopia or nearsightedness, Hypermetropia or farsightedness and Astigmatism which is characterized by distorted vision due to irregularly curved cornea of both eyes. Their values are in Diopter.

RESULTS

This Cross-sectional comparative study was conducted amongst 80 students out of which 43/80(53.8%) were having refractive errors. Minimum to maximum age was from 20 to 26 years with mean age in year’s value of 22.49. Median and mode values of Age coincide with a value of 22 years. Females were 54/80(67.5%) with 34/54(62.96%) having Refractive errors while only 9/26(34.61%) male students were having refractive Errors. Myopic were 42/80 (52.5%) out of which 2/42(4.76 %) also had Astigmatism, while 1/80(1.25%) had Hyperopia. Severe Myopic were 3.0/42 (7.14%) in both right and left eyes while 10/42(23.81%) fall in moderate category in right and 11/42(26.19%) in left eyes. Mild were 29/42(69.05%) in right while 28/42(66.67%) in left eye.

Significant association found between the Age, sex family history and the Refractive errors.

Table 2: Demographic Information

	Categories	Frequency	Percent
Age	20-22	42	52.5
	23-26	38	47.5
Sex	Female	54	67.5
	Male	26	32.5
Marital Status	Single	79	98.75
	Married	1.0	1.25

Table 3: AGE wise Prevalence of Refractive Errors

Ages	Not having Refractive Errors	Having Refractive Errors	Total
20	1.0	1.0	2.0
21	3.0	5.0	8.0
22	10	22	32
23	14	13	27
24	9.0	1.0	10
26	0.0	1.0	1.0
Total	37	43	80

Table 4: Refractive Errors and Types

Refractive Errors	Myopia 42/80 (52.5%)		Hyperopia 01/80 (1.25%)		Astigmatism (with Myopia) 02/80 (2.5%)	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye
Severe	3.0 (7.14%)	3.0 (7.14%)	0.00	0.00	0.00	0.00
Moderate	10(23.81%)	11(26.19%)	0.00	0.00	0.00	0.00
Mild	29(69.05%)	28(66.67%)	1.0 (1.25%)	1.0(1.25%)	2.0(2.5%)	2.0(2.5%)

Table 5: Comparison of students with and without refractive errors

	Refractive error 43/80 (53.75%)	No Refractive error 37/80 (46.25%)	
1. Father, mother, or any family members having refractive error.	32 (40.0%)	14(17.5%)	
2. Spend most of time in reading books	19(23.75%)	17(21.25%)	
3. Extracurricular activities	Computer games	30(37.5%)	18(22.5%)
	Outdoor games	13(16.25%)	19(23.75%)

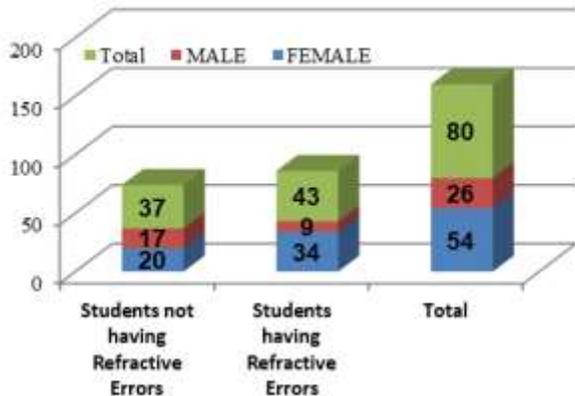
DISCUSSION

According to a study conducted among Medical College students from Kathmandu, Dominica, Era’s Lucknow and Pakistan, refractive errors prevalence remained 52.6%, 49.5%, 54% and 67.77% respectively.⁹⁻¹² The current study finding 53.8% is far less than another medical college study from Pakistan 67.77% , almost same prevalence of Refractive error 52.6% & 54% according to a study conducted from India but higher than findings of a study from Dominica having 49.5% prevalence of Refractive errors. As far as Sex distribution of Refractive errors is concerned the females were affected more in accordance with the study from Kathmandu, Dominicia and Pakistan stating that females were affected more than male Medical students.^{9,10,12} Current study has shown Myopic were 42/80 (52.5%) out of which 2/42(4.76 %) also had Astigmatism while 1/80(1.25%) had Hyperopia. According to Study from Dominica, 30.5% were Myopic, 12.0% were having

Hypermetropia and 33.5% had Astigmatism while another study from Pakistan has shown 37% having Myopia 23.7% having Hypermetropia and 7% Astigmatism. Comparison of previous and current has shown same trend from Pakistan, with higher number of Myopia followed by Hypermetropia and least were having Astigmatism contrary to findings of Dominica where Astigmatism exceeds Myopia and Hypermetropia. As far as severity is concerned current study findings 7.14% were Severe Myopic in both right and left eyes while 23.81% and 26.19% fall in moderate category in right and left eyes respectively. Mild were 69.05% in right while 66.67% in left eye. Among medical student of Era’s Lucknow Medical College 77.7% were Myopics with 62.8% , 35.4% falling in mild ,moderate category respectively.¹¹ The current findings have shown less moderate cases but more in mild category of refractive errors in comparison to findings of Era’s Lucknow Medical College. According to another study conducted from

Pakistan, Medical students have shown significant association of refractive errors with positive family history¹² in accordance with the current findings.

Figure 1: SEX wise Prevalence of Refractive Errors



CONCLUSION

High Refractive Errors prevalence especially Myopia among female MBBS students tends to be alarming. It demands implementation of more structured student awareness campaigns focusing genetic factors to help prevention and control of increased eye defect prevalence among medical students, society and Nation at large. Future study can be focused on possible causes of high Refractive Errors among female medical students.

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Conflict of interest: Authors declare no conflict of interest.

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AUTHOR'S CONTRIBUTIONS

RSK: Manuscript writing, result, discussion

AA: Introduction and methods

SB: Data collection, questionnaire, referencing