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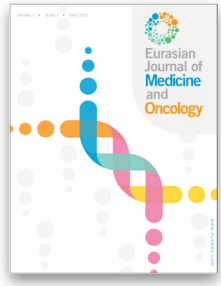

Research Article

Prevalence and Progression of Refractive Errors Among El-Mustansiriyah Medical Students

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Abstract

Objectives: Refractive errors (RE) are defined as an error in focusing light on the retina and are a frequent reason for reduced visual acuity. The 3 most common types of RE are: myopia, which is difficulty seeing distant objects clearly; hypermetropia, which is difficulty seeing close objects clearly; and astigmatism, which is distorted vision resulting from an irregularly curved cornea. The aim of this study was to investigate the prevalence of RE among medical students at Al-Mustansiriya Medical College and to evaluate associated factors.

Methods: A cross-sectional study was conducted at Al-Mustansiriya Medical College to assess RE among medical students. The data collectors were divided into 6 groups to gather data provided by the students of each annual cohort. Some incomplete forms were excluded.

Results: In this study, it was determined that about 33% of all students at Al-Mustansiriya Medical College had RE, with myopia being the most prevalent type (57.58%), especially in the fourth year students (25%), while the least common was hypermetropia (2.73%). There was quite a difference in the ratio of males and females with RE (38.48% and 61.52%, respectively).

Conclusion: Myopia was the most common eye problem observed among medical students. The incidence of myopia was greater in females than in males in all cohorts.

Keywords: Medical students, refractive errors

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IRAQ is a country that has experienced the ruthless face of war, yet the scientific work of scientists from IRAQ is promising for the future of their country. We congratulate the writer for his efforts to contribute to science with limited facilities.

During the past decades, population-based studies on refractive errors (RE), which is defined as an error in focusing light on the retina and is a frequent leads to reduced visual acuity,[1] have revealed substantial variations in prevalence related to ethnicity, education level, age, gender, and socio-economic status.[2]

The three most common types of RE are as follows:

- Myopia–this is difficulty in seeing distant objects clearly.
- Hyperopia, also known as hypermetropia–this is difficulty in seeing close objects clearly.
- Astigmatism–this is distorted vision resulting from an irregularly curved cornea.[3]

RE cannot be prevented, but they can be diagnosed with the help of an eye examination and can be treated with corrective glasses, contact lenses, or refractive surgery. If corrected in time and by eye-care professionals, they do not impede the full development of good visual function.[4]

For students, the inability to read standard-sized print, to see the chalkboard, overhead projection, or the computer, or to discriminate color can have a significant impact on their education.[5] Medical students who spend prolonged periods of time on reading and close-up work are a select

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population with a high level of education, and because of their intensive study regimen that lasts for many years, medical students have been reported to be at a high risk for RE.[6]

Objectives

We aimed to investigate the prevalence of RE among medical students in Al-Mustansirya College of Medicine and to evaluate associated factors.

Methods

The was a cross-sectional study. The data was collected in Al-Mustansirya College of Medicine, Baghdad, Iraq, between March 9, 2016 and April 20, 2016.

The study was carried out on 330 students in six stages (males 127, females 203) of 18-26 years.

Data collection was done via a self-reporting questionnaire; the questionnaire was in English and some medical terms were translated into Arabic to be easily understood by participants.

The following data were obtained from the self-administered questionnaire: age, gender, type of eye problem, duration of it, at which grade they started wearing eye glasses, and if they wore it before college.

Table 1. Showing the distribution of RE among grades

Refractive errors	1st	2nd	3rd	4th	5th	6th
Myopia	64.71%	60.38%	61.76%	67.47%	50.88%	43.48%
Hypermetropia	0	7.55%	2.94%	0	0	5.80%
Astigmatism	11.76%	20.75%	2.94%	14.46%	17.54%	20.29%
Combined	23.53%	11.32%	32.35%	18.07%	31.58%	30.43%

Table 2. The duration of RE among grades

Duration of RE	1st	2nd	3rd	4th	5th	6th	%
Less than 5 years	50.00	54.72	52.94	56.63	38.60	47.83	50.3
5-10 years	17.65	30.19	32.35	34.94	50.88	39.13	35.7
More than 10 years	32.35	18.87	14.71	8.43	10.53	13.04	14

Table 3. Parents with RE among grades (in %)

Parents	1st	2nd	3rd	4th	5th	6th
Mother	11.76	15.09	2.94	10.84	19.30	15.94
Father	23.53	3.77	26.47	20.48	8.77	23.19
Both	17.65	28.30	44.12	44.58	31.58	31.88
None	47.06	52.83	26.47	24.10	40.35	28.99

Approximately half (54.24%) did not undergo any surgical correction but were interested, the other half did not undergo surgical correction and did not show any interest.

Results

In this study, we found that about 33% of all students at Al-Mustansirya Medical College have RE, with myopia being the most prevalent type (57.58%), especially in the fourth grade (25%), while the least common type was hypermetropia (2.73%). There is quite a difference in the ratio between males and females with RE (38.48%, 61.52% respectively).

Discussion

RE are the most frequently occurring ocular disorders, especially in the young academia. Several studies have been conducted in different universities to document the prevalence of these RE. Thus, this study aimed to determine the

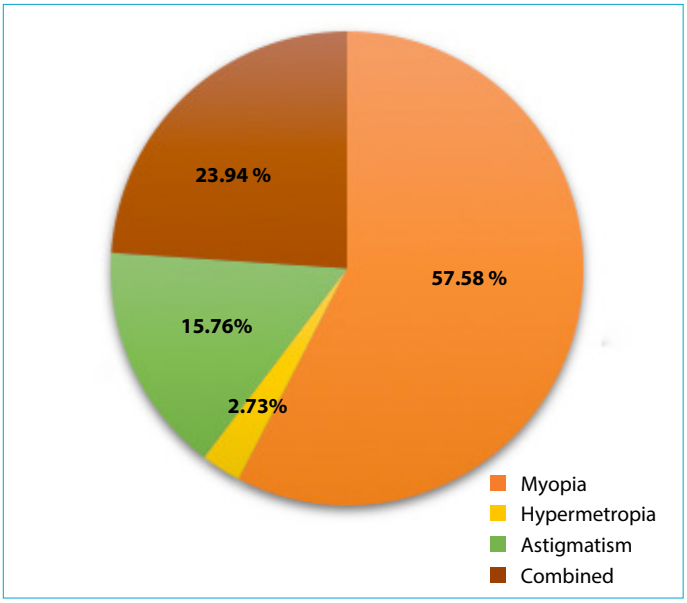

Figure 1. The percentage of RE among medical students.

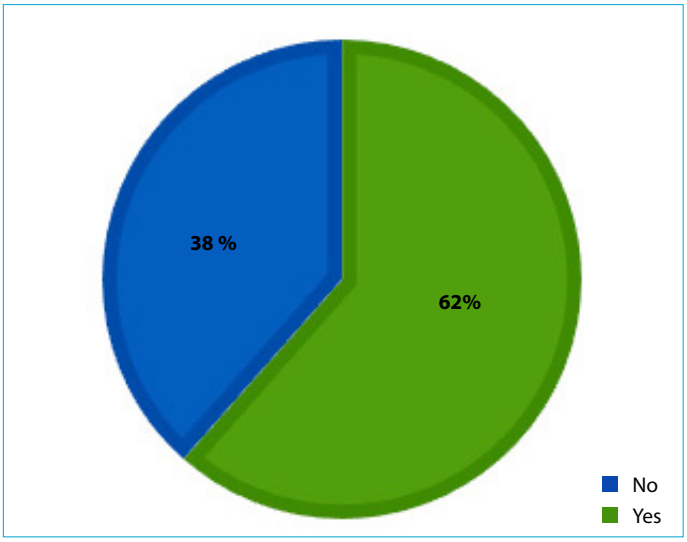

Figure 2. Distribution of filters in eyeglasses.

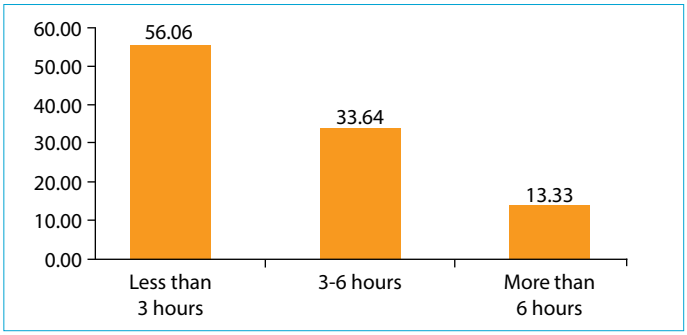

Figure 3. Reading hours among subjects on a daily basis.

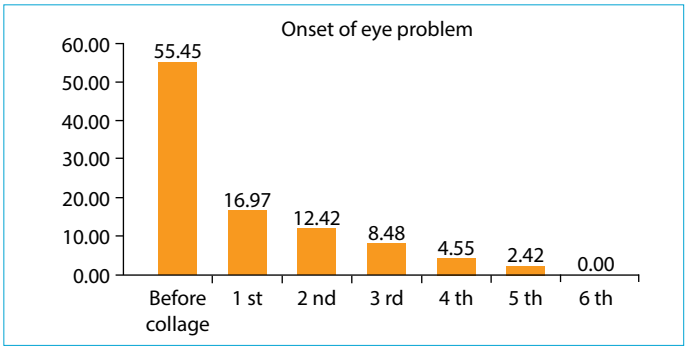

Figure 4. The onset of refractive errors among medical students.

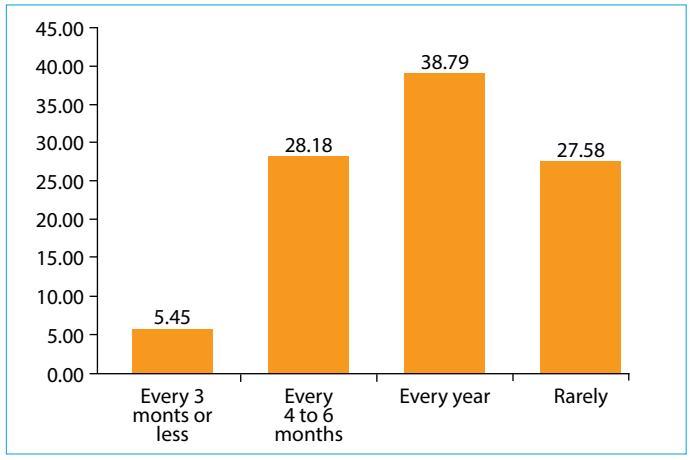

Figure 5. The frequency of eye exam among subjects.

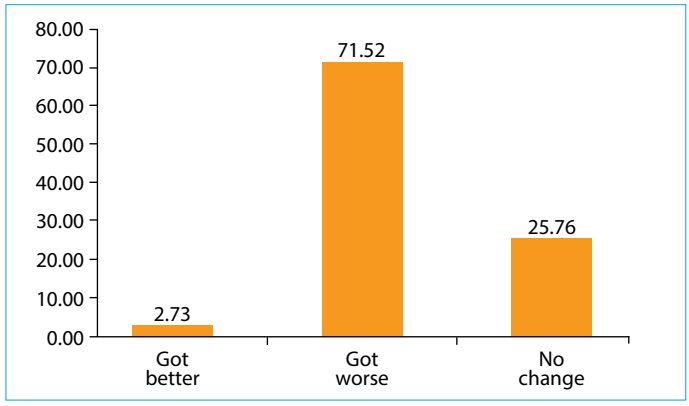

Figure 6. The progress of refractive errors during medical college.

prevalence of RE in Al-Mustansirya Medical College and factors that may associated with them.

The prevalence of RE in Al-Mustansirya Medical College was 33%, which is less than the prevailing rate among medical students of other Asian populations such as in Singapore (89.8%) or Taiwan (92.8%).[7, 8] These variations may be attributed to ethnicity and different genetic predispositions.

The highest prevalence of RE was found in the fourth grade (25.15%), and the lowest prevalence was in the first grade (10.3%). This high prevalence in the fourth grade compared with the other grades in the college is worth noting even if it cannot be medically explained but it can be related to the fact that the fourth grade was responsible for this survey so they can distinguish students who suffer from RE from those who do not and they made the cases hardly missed while some student in other grades can be missed which lead to this result.

Regarding the type of eye problem, the most prevalent RE was myopia (57.58%), in a similar study carried in India the prevalence of myopia was 60%[9], the exact pathogenic mechanisms of myopia is unknown but it can be associated with higher IQ score, high level of educational attainment,[10] and above average intelligence.[11]

Some studies have shown that RE prevalence was more associated with longer near-work activities such as time spent on reading, writing, computer work, and usage of cell phones; thus, in this study we asked the students with RE about their reading hours per day and found that 56% of them read for less than 3 hours on a daily basis. This indicates no significant association between the time spent on reading and the prevalence of RE, in which is similar to the data in a study conducted in Kerala Medical College in which 44% of the students with RE read for 2–3 hours daily.[12]

Also, in this study the students were asked about the daily usage of electronic devices, like smart phones, tablets, and computers, which revealed that 43.03% of them use these devices for more than 6 hours per day and 36.06% for 3-6 hours daily.

We believe that electronic devices such as computers and cell phones, which may be used by students for their medical studies due to the beneficial medical applications of these devices which were not in use during their school days, have replaced reading as the main near-work activity that may be associated with the development and progression of RE in modern students and this may explain why RE in 71.52% of the students worsens during their medical course.

The least prevalent RE was hypermetropia (2.73%); studies showed that medical students in Singapore also exhibited

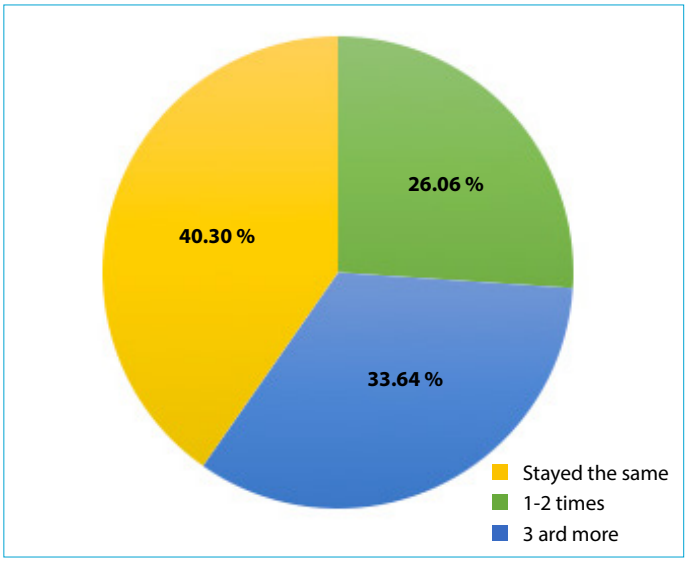

Figure 7. Number of times medical students had to change their eyeglasses prescription.

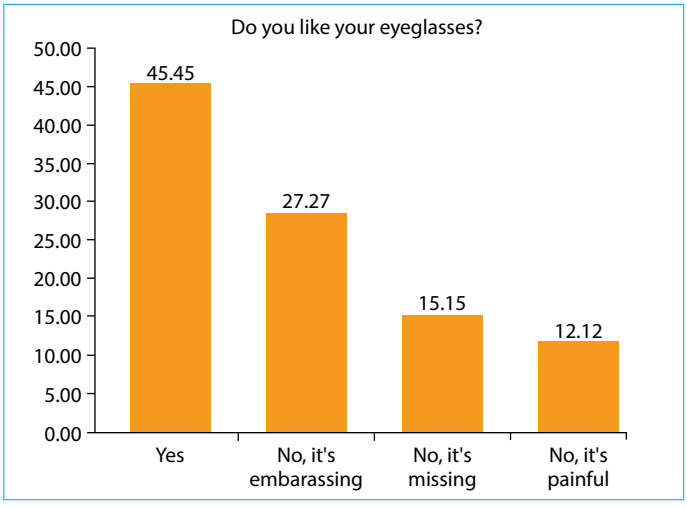

Figure 8. Medical students like or hate their eyeglasses.

a low prevalence of hypermetropia (1.3%).[13, 7]

The cause for this low prevalence can be that hypermetropia is often present from birth due to low the converging power of eye lens and abnormal shape of the cornea, but children and young adults have a very flexible eye lens, which helps make up for the problem; thus, hypermetropia usually appears at a more advanced age when the eye lens loses its flexibility.[14]

Regarding the onset of the development of RE, in 55.45% of the students their RE had begun before joining college, while 44.55% of them developed RE during medical studies; 16.97% of these students developed RE in their first year of college, while there is no student in the sixth grade his/her refractive had started in the sixth year. These findings may be explained that the medical students may have more intensive near work habits right from their school days, even before their entering the medical college.[9]

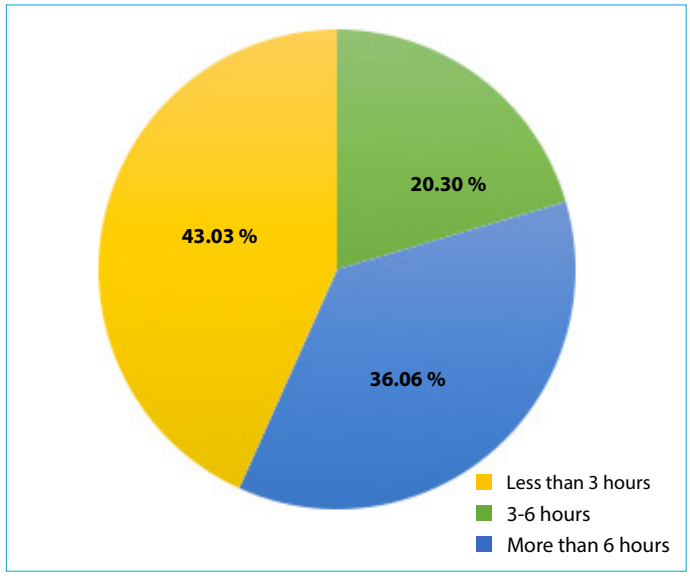

Figure 9. Daily usage of smart devices among medical students.

Regarding the usage of eye glasses filters, this study shows that 61.52% of the student use eye glasses with filters, this can be related to the benefits of eye glass filters in reducing the reflection of bright lights and glare on the lenses of the glasses so that it minimizes eye strain when using computers and smart phones,[8] while only 38.48% of the students use glasses with no filter. This percentage can be related to the fact that these students use their glasses only for reading, so there is no need to use eye glass filters.

In this study, we found that one of the parents had RE in 30.6% of ametropic students, the mothers had RE in 13.3% of these students, their fathers had RE in 17.27%, and both the parents had RE in 34.24% of the students, that also found in Indian study about RE among medical students of Melaka Manipal college in which the prevalence rate of the students who have one of their parents with RE was 18% and 48% of them both of their parents have the RE and that indicates the parenteral history of RE has an increasing incidence.[15]

In spite of numerous studies that revealed that genetic factor plays a role in the development of RE, in this study we found that the parents did not have RE in 35.15% of ametropic students.

Concerning the students' interest in undergoing refractive surgery in this study, we found that 54.24% of the students desired it mainly to get rid of eye glasses for cosmetic purposes, as the eye glasses impede them from taking part in many sports, and they need to visit the eye clinic to get them checked, while 41.52% of them not interest to do it may be due to fear from the risk of the operation or afraid from the

regression of the RE as some of them can return and may need another surgery or return back to the eyeglasses.[16, 17]

In this study, it has been found that 27.58% of the students rarely get their eyes examines, while 72.42% of them undergo the examination every year or less frequently. Also, 76.06% of them had their eyes checked less than a year ago.

Recommendation

- Eye examination is important for students before entering medical college.
- Proper use of phones and laptops is advised to decrease deterioration of visual acuity.
- Eye clinics should be within easy reach of medical student and eye glasses should be affordable.

Conclusion

- Myopia is the most common eye problem among medical students.
- The severity of eye problem was less frequent in the first year of college.
- Family history is more common in students wearing eye glasses.
- The prevalence of myopia is more in females than in males in all years of college.

Disclosures

Ethics Committee Approval: The study was approved by the Local Ethics Committee.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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