

The Prevalence of Myopia among Sample of Jazan University Students during the Academic Year 1435-1436

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Abstract: Many students complain of headache and poor concentration, may attributed to myopia, due to the excessive exposure to near vision resulting from some bad studying habits, reading books intensively and improper exposure to electronic devices for a long period or other daily habits that may have an impact directly or indirectly on the vision. The goal is to identify the prevalence of myopia among Jazan university students.

Material and result: A cross sectional study from medical & non-medical faculties has done as a cluster samples. Data is collected along four days duration using a semi-structured questionnaire after taking a verbal informed consent, Data processing by SPSS v20. We found that 78% of whole students study in improper position; there is high percentage of genetic factor among the students. The medical students spend most of their time in studying, while the non-medical students spend it on E-devices. 62% of students who are spend more than 3 hours in studying, and 89.3% of students who spend more than 3 hours in E-devices are myopic.

Conclusion: Myopia is a problem affecting Jazan university students whether those attending scientific type of studies (medical students) as well as non-medical, there is no difference of statistical significance between them in the point-prevalence of myopia, instead it is more or less the same about (50%). However, the environmental (modifiable) risk factors differ as medical students use electronic in studying, but non-medical students in other activities. The majority of students doesn't practice eye relaxing exercise and don't follow proper positioning during studying. So, it is recommended to design an education program aiming at controlling the myopia problem.

Keywords: Myopia, Medical students, Near work, Jazan University.

1. INTRODUCTION

Myopia is a common chronic eye diseases which defined as the impaired ability or blurring for far vision (1), in our life we are surrounded by a lot of people who are suffering from myopia in many places, at the university, in the street, in the market even in our families. Some of them use glasses and some prefer to wear contact lenses as a practical and more comfortable way, other has ambition to correct myopia by surgical interference.

With the remarkable evolution in the technology and smart E-devices the number of peoples who are affected by shortsightedness and other eyes problems are increasing, We almost used to see that elderly people are the most who suffer from vision problems but in recent decades, there is a marked rise in the proportion of teenagers and children regardless of the genetic factors which cannot be controlled.

The causes of the myopia might be Physiological, environmental or genetic; Physiological causes are the increasing in the axial length of the eye i.e. the eyeball is too long or that the cornea may have too much curvature. Both genetic and environmental factors are believed to be strongly associated with the incidence and progressions of myopia. The genetic factor strongly associated with having members of the family with myopia. Near work e.g. reading, writing, computer

work and close television viewing, is considered the most important environment risk factor, as it requires high accommodation.⁽²⁾⁽³⁾ Myopia symptoms may include the one or more of the following:

- Blurred vision when looking at distant objects.
- Blepharospasm to have clear vision.
- Headaches caused by excessive eyestrain.
- Impaired visual ability while driving a vehicle, especially at night (night myopia)."⁽⁴⁾

The Major risk factors for myopia include; diabetes, visual stress, and genetic (family history).⁽⁵⁾ Now days many studies report continuous increase in the frequency of occurrence of myopia among teenagers, young children even in adults, because of the wide spread of smartphones.⁽⁶⁾

Objectives:

General:

To identify the prevalence and the associated factors with myopia among faculty of medicine students.

Specific:

- To compare of the prevalence of myopia in medical students with comparable matched non-medical control group.
- To identify the risk factor associated with myopia.

2. MATERIAL AND METHODS

Study area: Jazan University.

Study design:

It is a cross-sectional type of observational epidemiologic study is carried out at a single point in time (point prevalence), about three weeks duration from 25 September to 18 November 2014, to estimate the point prevalence of myopia.

Place:

Two faculties: faculty of medicine, and faculty of arte & humanities.

Study population:

Total of 400 students are the estimated subjects for the study. Two groups are chosen from 2 faculties, Two hundred male & females attending faculty of medicine, Jazan n university as a study group, another two hundred male and females comparable group attending faculty of arte & humanities

Exclusion criteria:

- Congenital anomalies.
- Past history of Eye injuries

Sample size:

Calculated by using this equation:

$$n = z^2_{1-\alpha} P (P - 1) / d^2$$

Where:

- Anticipated population proportion (P)
- Confidence level 95 %
- Absolute precision required on either side of the anticipated population proportion (in percentage points) $d = 5\%$ (0.05)
- The anticipated population proportion (P) of the sample is estimated to be 50% because this is the safest choice for (P) since the sample size required is largest when $P=50\%$.
- **For 95% confidence level $z = 1.96$, then the formula becomes as following:**
- $n = (1.96)^2 * 0.5 * (1-0.5) / (0.05)^2 = 384.16$
- Study group **200** = medical students.
- Control group **200**= non-medical students.

Sample type:

Cluster –stratified to select the target sample.

- The university is stratified into, two strata according to the specialties, scientific faculties & art faculties.
- Two large clusters, one from each stratum (200+200=400 students), Both of them is chosen for convenience.
- The faculty of medicine is chosen representing scientific type of study (200 students).
- The faculty of humanities is chosen to represent arte type of study (200 students).
- **Two strata:**
 - Each of the two faculties is divided into two strata according to gender (4 strata 100 student each).
- Two clusters, they are chosen for convenience.**
 - The chosen four strata are divided into clusters.
 - Two clusters are chosen from each unit (50 students in 8 clusters).

Data collection:

The data collection is carried-out by the use of a semi-structured questionnaire through personal communication of the investigators themselves, after explaining the objectives of the study to the target students. This semi-structured questionnaire is generated & adapted to suit our culture using the Arabic language by the investigators themselves, after reviewing many literatures & studied about myopia. The questions yield data about (Age in years - Gender – Major - Academic year - Academic score - Economic status – Residence – Diabetic - Visiting Ophthalmologist - Causes of visiting Ophthalmologist - Strain or headache with concentration – Myopic - Beginning of myopia - Family history of myopia - Family members suffering from myopia - Type of correction - Operation to correct myopia - Changing in state of sight - Study ways - Using electronic device in study - Studying position - Hours spend in studying - Hours spend on electronic device - Type of device used in daily life – Hobbies need using e-devices - Rest during study or using e-device - Eye exercising to decrease eye straining - Changing in academic score after being - Usual sleeping hours).

Statistical design:

Data will be presented, analyzed to measure the point prevalence of myopia by the use of chi-square & p value using of the SPSS package v20. Confidence level is chosen at 95%.

3. RESULTS

Table-1. Distribution of the studied sample according to personal and socioeconomic characteristic

Type of faculty Variable		Medical n=189		Non-medical n=188		χ^2	P-value
		No.	%	No.	%		
Age	18-<22 n=253	148	78.3	105	55.9	21.532 ^a	.000
	22-26 n=124	41	21.7	83	44.1		
Gender	♂ n=185	93	49.2	92	48.9	.003 ^a	1.000
	♀ n=192	96	50.8	96	51.1		
Residence	Rural n=257	126	66.7	131	69.7	.395 ^a	.581
	Urban n=120	63	33.3	57	30.3		
Economic status	Middle n=302	144	76.2	158	84	3.646 ^a	.071
	High n=75	45	23.8	30	16		

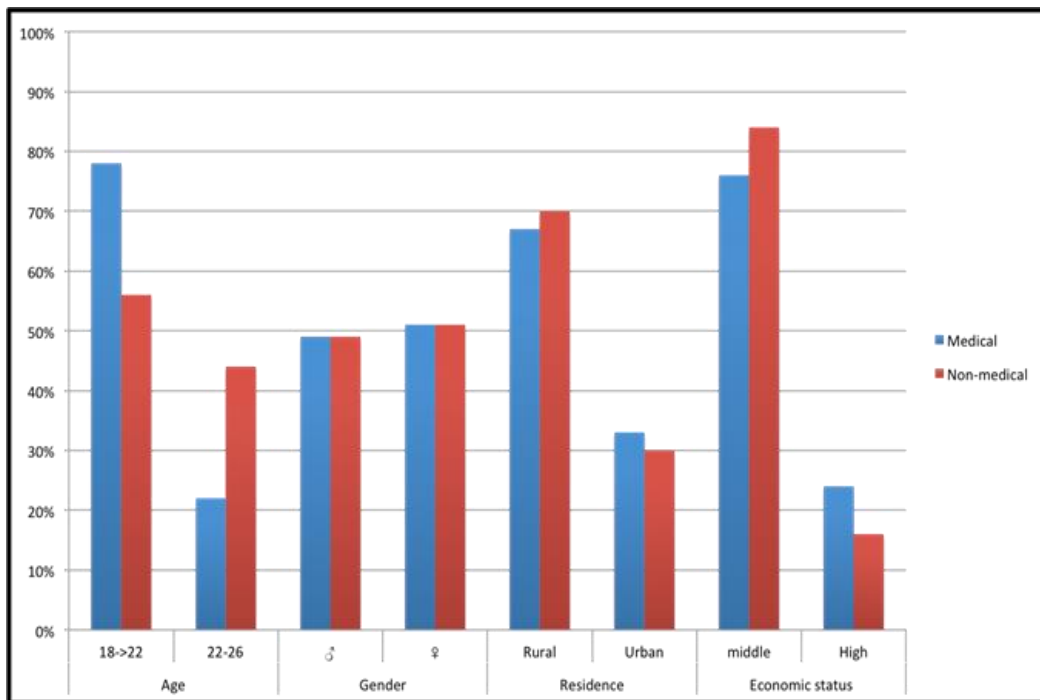


Chart-1. Distribution of the studied sample according to personal and Socioeconomic characteristic:

Both 2 group medical and non-medical are not matched regarding age. Both group show higher percentage in the same age groups 18-26. The Gender of 2 groups are matched, the difference is no statistical significance. The number of rural students more than urbanites students up to more than double in both medical and non-medical students. Eighty percent of whole Students are middle income, while 19% of them are high income in both medical and non-medical students.

Table-2. Distribution of the studied sample according to some risk factors for myopia

Type of faculty		Medical		Non-medical		χ^2	P-value
		n=189		n=188			
Variables		No.	%	No.	%		
Diabetic	Diabetic n=4	1	0.5	3	1.6	1.021 ^a	0.372
	Non-diabetic n=373	188	99.5	185	98.4		
Myopia	Myopic n=150	77	40.7	73	38.8	.144 ^a	0.753
	Non-myopic n=227	112	59.3	115	61.2		
Family history of myopia	Present n=273	140	74.1	133	70.7	21.532 ^a	.000
	Absent n=104	49	25.9	55	29.3		
Academic score	Less than 3 n=107	28	14.8	79	42	34.321 ^a	.000
	More than 3 n=270	161	85.2	109	58		

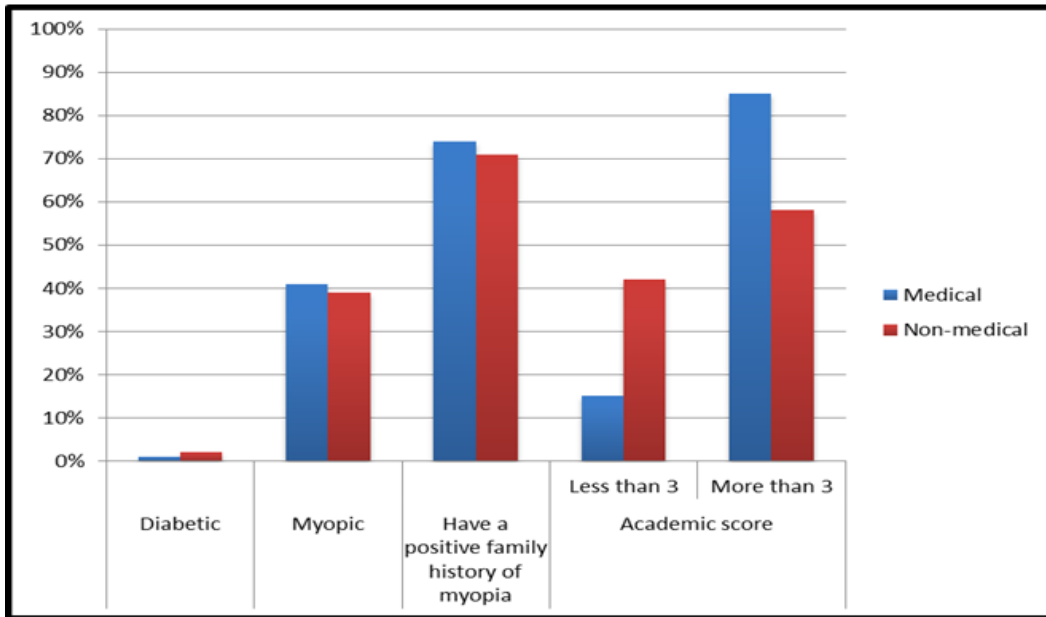


Chart-2. Distribution of the studied sample according to some risk factors for myopia

Diabetic students are 0.5% in medical group while it's 1.6% in non-medical group, so the difference is no statistical significance between diabetic and non-diabetic students in both groups. Myopia: the difference is no statistical significance in myopic students between medical and non-medical. Seventy-four percent of medical, and 70.7% of non-medical students have a family history of myopia. The difference is no statistical significance. Eighty-five percent of medical, and 58% of non-medical students have academic score more than 3. There is statistical significance.

Table-3. Distribution of the studied sample according to environmental risk factors (modifiable)

Type of faculty		Medical		Non-medical		χ^2	P-value
		n=189		n=188			
Variables		No.	%	No.	%		
Hobbies need using e-devices	Using e-devices n = 183	82	43.4	101	53.7	4.032 ^a	0.50
	Don't use e-devices n = 194	107	56.6	87	46.3		
Rest during study or using e-devices	Have rest n = 327	171	90.5	156	83	4.605 ^a	0.033
	Don't have rest n = 50	18	9.5	32	17		
Eye exercising to ↓ eye-straining	Do exercise n = 85	44	23.3	41	21.8	.117 ^a	0.805
	Don't do exercise n = 292	145	76.7	147	78.2		
Hours spend in study	Less than 3hrs n=153	44	23.3	109	58	47.058 ^a	.000
	More than 3hrs n=224	145	76.7	79	42		
Hours spend in E-devices	Less than 3hrs n=34	22	11.6	12	6.4	3.175 ^a	0.105
	More than 3hrs n=343	167	88.4	176	93.6		
Study position	Proper n=81	40	21.2	41	21.8	.023 ^a	0.901
	Improper n=296	149	78.8	147	78.2		
Type of device used in daily	Smart-phone n = 266	119	63	147	78.2	10.521 ^a	0.002

life	Other n = 111	70	37	41	21.8			
	Non E-devices n=277	133	70.4	144	76.6	68.783 ^a	.000	
Study ways	E-devices n=49	16	8.5	33	17.6			
	More than one n=51	40	21.2	11	5.9			
Using devices study	e-in	Using n=304	167	88.4	144	72.9	14.479 ^a	.000
		Non-using n=73	22	11.6	51	27.1		

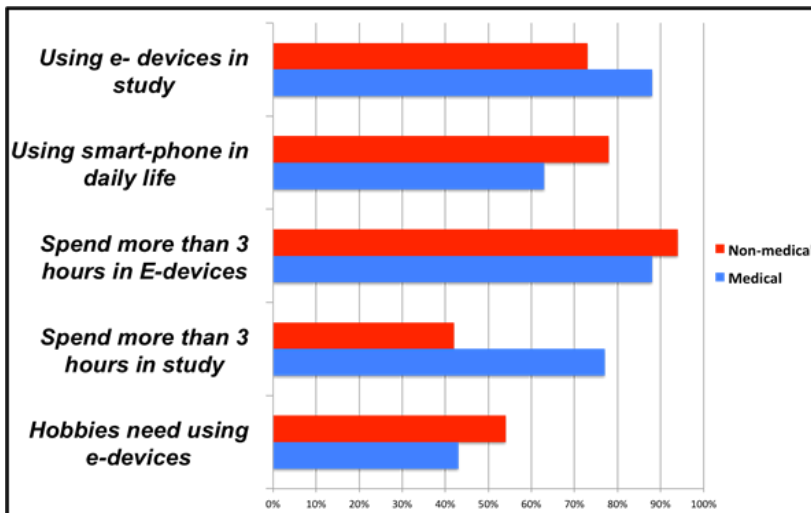
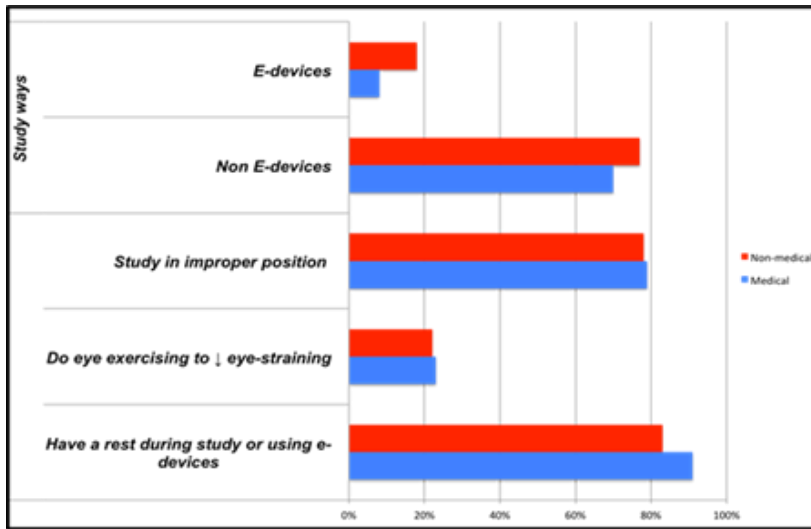


Chart-3. Distribution of the studied sample according to environmental risk factors (modifiable):

Forty-eight percent of whole student have hobbies need using E-devices, 44% of them are medical. Ninety percent of medical, and 83% of non-medical students are taking a rest during study and using of E-devices. The percentage of doing eye exercise to decrease eye straining in both medical and non-medical students are similar to each other. The difference is no statistical significance. Seventy-six percent of medical students spend more than 3 hours in studying, while 93.6% of non-medical students spend more than 3 hours using E-devices per day. Seventy-eight percent of medical students are studying in improper position, as will as the non-medical group have the same percentage. The most common used E-device in daily life in 63% of medical, and 78% of non-medical students is smart-phone. Seventy present of medical students, and 76.6% of non-medical students are using non E-devices, while 8.5% of medical, and 17.6% of non-medical students are using E-devices in studying. Eighty-eight percent of medical, and 72,4% of non-medical students are already studied in electronic devices.

Table-4. Distribution of the myopic and non-myopic sample according to personal and socioeconomic characteristic

Variables		Myopia		Non-myopic n=227		χ^2	P-value
		n=150					
		No.	%	No.	%		
Age	18-21 n=253	104	69.3	149	65.6	.559 ^a	0.502
	22-25 n=124	46	30.7	78	34.4		
Gender	♂ n=185	64	42.7	121	53.3	4.089 ^a	0.046
	♀ n=192	86	57.3	106	46.7		
Type of faculty	Medical n=189	77	51.3	112	49.3	.144 ^a	0.753
	Non-medical n=188	73	48.7	115	50.7		
Economic status	Middle n=302	114	76	188	82.8	2.636 ^a	0.115
	High n=75	36	24	39	17.2		
Residence	Rural n=257	102	68	155	68.3	.003 ^a	1.000
	Urban n=120	48	32	72	31.7		

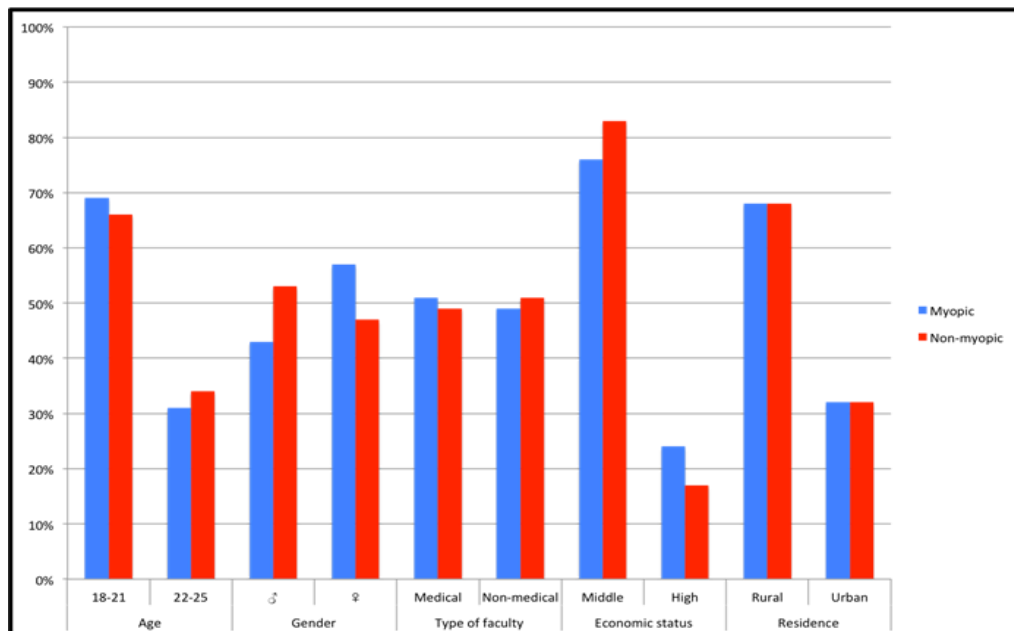


Chart-4. Distribution of the myopic and non-myopic sample according to personal and socioeconomic characteristic

Both studied myopic and non-myopic groups show higher frequency in age groups 18-26. The percentage of myopia among Males constitutes 42.7%, while in female it represented is 57.3%. The difference is of no statistical significance. Medical students show higher frequency of myopia 51.3% than non-medical students. The difference is of no statistical significance.

There is less percentage of myopia in high economic state compared with those with middle economic state. The difference is of no statistical significance. The percentage of myopia is higher in rural than urban residence. The difference is of no statistical significance.

Table-5. Distribution of the myopic and non-myopic sample according to some risk factors for myopia

Myopia Variables		Myopic n=150		Non-myopic n=227		χ^2	P-value
		No.	%	No.	%		
Diabetic	Diabetic n=4	1	0.7	3	1.3	.369a	1.000
	Non-diabetic n=373	149	99.3	224	98.7		
Academic score	Less than 3 n=107	45	30	62	27.3	.321a	0.641
	More than 3 n=270	105	70	165	72.7		
History of myopia	Present n=273	122	81.3	151	66.5	9.922a	0.002
	Absent n=104	28	18.7	76	33.5		

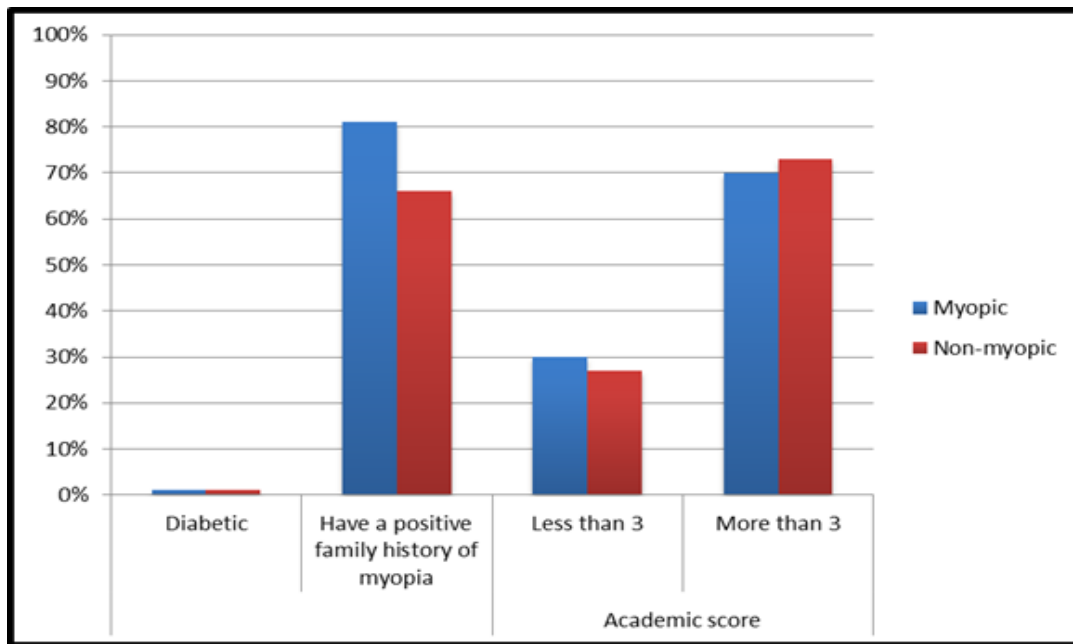


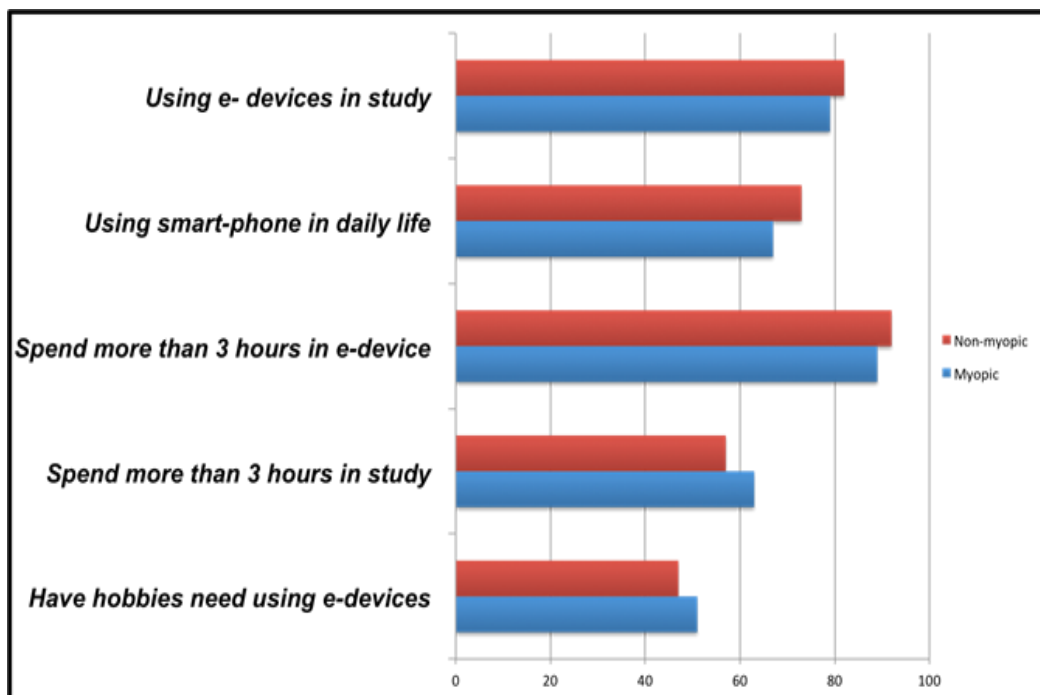
Chart-5. Distribution of the myopic and non-myopic sample according to some risk factors for myopia

The table shows that the diabetic frequency among the sample is very low about 2%; only 0.7 of myopic students are diabetic. Seventy-one of the whole group has academic score more than 3, (70% for myopic, and 72.7% for non-myopic). Eighty-one of myopic students have positive family history for myopia, while its only 66,5% in non-myopic. The difference is of no statistical significance.

Table-6. Distribution of the myopic and non-myopic sample according to environmental risk factors (modifiable)

Myopia Variables		Myopic n=150		Non-myopic n=227		χ^2	P-value
		No.	%	No.	%		
Hobbies need using e-devices	Using e-devices n = 183	76	50.7	107	47.1	.451 ^a	0.529
	Not using e-devices n = 194	74	49.3	120	52.9		
Rest during study or using e-	Have rest n =327	132	88	195	85.9	.345 ^a	0.642

devices	Don't have rest n =50	18	12	32	14.1		
Eye exercising to ↓ eye-straining	Do exercise n =85	31	20.7	54	23.8	.504 ^a	0.530
	Don't do exercise n = 292	119	79.3	173	76.2		
Hours spend in study	Less than 3hrs n=153	56	37.3	97	42.7	1.091 ^a	0.335
	More than 3hrs n=224	94	62.7	130	57.3		
Hours spend in	Less than 3hrs n=34	16	10.7	18	7.9	.825 ^a	0.365
	More than 3hrs n=343	134	89.3	209	92.1		
Study position	Proper n=81	27	18	54	23.8	.703 ^a	0.201
	Improper n=296	123	82	173	76.2		
Type of device used in daily life	Smart-phone n = 266	100	66.7	166	73.1	1.815 ^a	0.204
	Other n = 111	50	33.3	61	26.9		
Study ways	Lectures n=277	110	73.4	167	73.5	3.405 ^a	0.333
	E-devices n=49	16	10.6	33	14.6		
	More than one n=51	24	16	27	11.9		
Using e- devices in study	Using n=304	118	78.7	186	81.9	.619 ^a	0.428
	Non-using n=73	32	21.3	41	18.1		



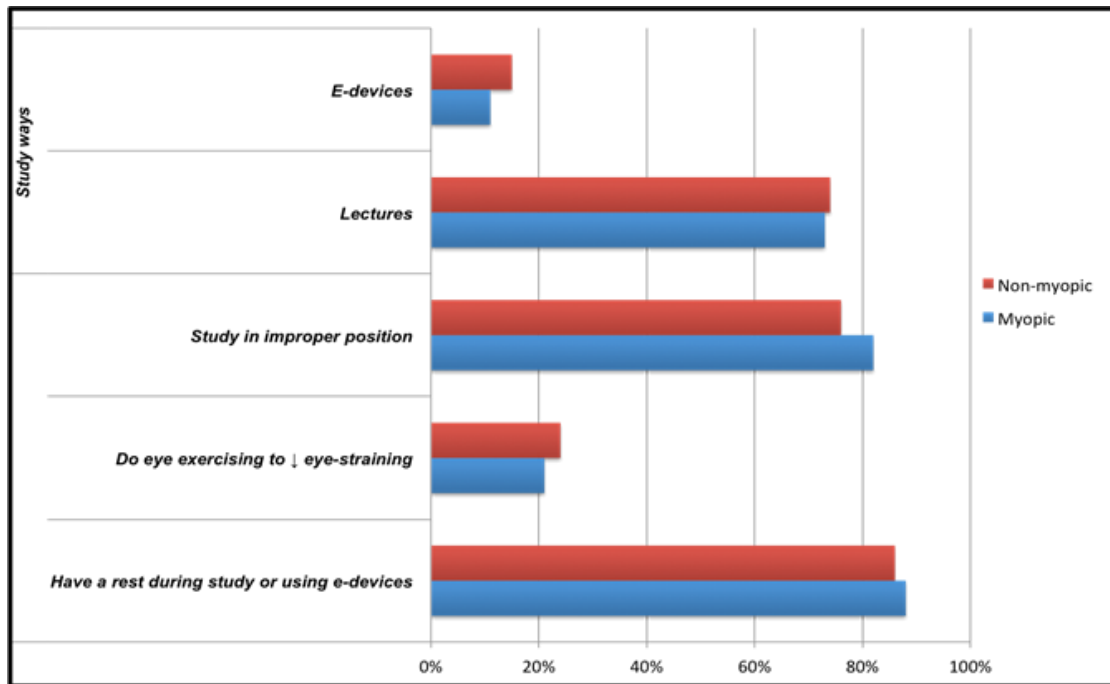


Chart-6. Distribution of the myopic and non-myopic sample according to environmental risk factors (modifiable)

Fifty percent of myopic students are accustomed to use E-devices, while 74.1% of non-myopic have the same accustomed. Difference is of no statistical significance. The study shows that 86.7% of all students take a rest during studying or using E-devices because the suffering of eyestrain, and just 22.5% of all students making exercise to relieve it. Sixty-two percent of students who are spend more than 3 hours in studying, and 89.3% of students who spend more than 3 hours in E-devices are myopic. Seventy-eight of whole students study in improper position 41% of them is myopic. Seventy percent of whole students using smart-phone in their daily life, 37% of them are myopic. Ten percent of myopic students are use E-devices in studying, while 73.4% of them using non-E-devices ways, and about 16% use both of them. Thirty-eight percent of students who are using E-devices in study are myopic, while 61% of them are non-myopic.

4. DISCUSSION

The age distribution of myopia in students with age group less than 22 was 69.3% and 78.3% of them were myopic, while the percentage of myopia in students with in age group more than 22 was 30.7% and 21.7% of them were myopic. (Table-1, Table-4) This agree with a research have been done in U.K at 2013⁽⁷⁾ conclude that the gene of increasing of myopia is almost stop about 21, But another done randomly in Srinagar at 2008⁽⁸⁾ show that the risk of myopia increase with age increasing which opposite to our result. The gender distribution in the sample was equaled to each other, and the frequency of myopia in females was 57.3% while in the males was 42.7%. Study done in India at 2008⁽⁸⁾ show that the myopia prevalence in the female is more than male. (Table-1, Table-4).

The percentage of myopia in high economic state, and urban residence students was less than the students with middle economic state and rural residence. The lowest frequency of risk factor of myopia among the sample is diabetes. (Table-1, Table-4).

This study reveals that the point prevalence of myopia in medical student 40.7%, and non-medical 38.8%, while overall myopia point prevalence is 39.7% (Table-2), this agree with study done in India at 2013⁽⁹⁾ conclude that the prevalence of myopia are more in medical student. The study show that the percentage of myopic student who have positive family history of myopia was 81.3% and who have a negative family history was 18.7 %, and the medical students who have a positive was 74.1% and the percentage of non-medical students who have a positive was 70.7%, this agree with study done in turkey at 2007⁽¹⁰⁾ show that the parental myopia more prevalent among medical student. (Table-2, Table-5)

The study results reveal that the percentage of medical students who have Academic score more than 3 was 85.2%, while the non-medical was 58%, on the other hand the percentage of all myopic students who have Academic score more than 3 was 70%, while the non-myopic students was 72.7%. (Table-2, Table-5). Seventy-eight percent of whole students study in improper position 41.5% of them was myopic (50% of them were medical). (Table-3, Table-6).

Thirty-seven percent of students whose using smartphone in their daily life are myopic (55% of them were non-medical), this agree with what Doctor David Alamby laser eye surgeon noticed that the percent of myopia had been a 35 % raise since the lunch of smartphones in 1997⁽⁷⁾. (**Table-3, Table-6**). The study shows that 86.7% of all students take a rest during studying or using E-devices when they have eyestrain, and just 22.5% of all students making exercise to relive it. (**Table-3, Table-6**).

In myopic students 50% of them were practicing hobbies based on E-devices. 62% of them were spending more than 3 hours in studying, and 89.3% of students who were spending more than 3 hours in E-devices also myopic. 10% of them were using E-devices in studying, while 73.4% of them using non-E-devices ways, and about 16% using both of them. 38% of students who were using E-devices in study were myopic. (**Table-3**)

Among medical students 44% of them have hobbies need using E-devices. 76% of medical students spent more than 3 hours in studying, while 88.4% of them spent more than 3 hours using E-devices per day. 8.5% of them were using E-devices in studying, while 70.4% of them using non-E-devices ways, and about 21% using both of them. 88.8% of them were using E-devices in study. And all above agree with study done in India at 2013⁽⁹⁾, and other in 2014⁽¹¹⁾ conclude that the near work for long time can cause myopia. (**Table-6**).

5. CONCLUSION

It is concluded that, myopia is a problem affecting Jazan university students whether those attending scientific type of studies (medical students) as well as non-medical in more or less equal proposition, this proposition exceeds that estimated for the population.

The modifiable risk factors associated with myopia in medical students is estimated to be long duration of studying, however the modifiable risk factors associated with myopia in the Art and Humanities students is prolonged use of electronic devices. The majority of students the study group and control group doesn't practice eye relaxing exercises, doesn't follow proper positioning during studying.

So, it is recommended to educate students about the practices that could control the exposure to the modifiable risk factors as:

1. Practicing eye exercises to minimize eyestrain.
2. Proper positioning during reading & studying.
3. Minimizing the hours spent in studying using e-devices, to be replaced by the use of books...etc.

6. RECOMMENDATION

Goal:

The goal is to control the problem of myopia that affects about half of jazan university students.

Operational objective:

- Early detection of case of myopia.
- Prevent further deterioration in visual acuity.

Intermediate targets that should & the message:

Medical and educational program should be directed to special targets, which are:

The family:

- Health education of all members of the family to increase their awareness about the problem of myopia, its risk factors, hazard and healthful life style practices.
- Basic knowledge about eye care for preserving visual acuity.

Health care system:

They include the physician, and the nurses.

- Practice guidelines could be administered to health care providers about criteria of early detection of myopia, through continuous in service professional development programs.
- They should provide visual acuity preservation Education programs.

At school:

Schools are responsible for myopic children through:

- Schoolteachers should participate actively in screening programs for early detection of myopia.
- Efficient and effective medical services provided for school children for managing the problem of myopia.
- The schoolteachers should have the knowledge on how to deal with myopic children.

Students:

They are important part of management plan for myopia, they should know:

- The importance of screening as an early measure for detection of myopia.
- The importance of leading healthy life to preserve their "Eyes", through proper use of the eyes through:
 - a- Avoidance of hobbies based on the use of electronic devices.
 - b- Eye exercises to minimize eyestrains.
 - c- Proper positioning during reading & studying.
 - d- Minimizing the hours spent in studying using e-devices.

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