

Visual Display and Dry Eye Related Symptoms among Medical Students During Corona Virus Waves

HASSAN SHAMSELDEN YOUSEF, M.D.

The Department of Ophthalmology, Faculty of Medicine, Assuit Al-Azhar University

Abstract

Background: The pandemic of coronavirus disease 2019 (COVID-19) continues to have a massive and probable long-term impact on the global population and health-care systems. DED is a prevalent ocular surface ailment that affects millions of people throughout the world. Various management and care delivery experiences in subspecialties such as glaucoma, medical retina, neuroophthalmology, and uveitis have been documented from throughout the world during the epidemic. Because there are no studies in Egypt that detail the effects of corona on medical students' eyes, this study will be undertaken to give us with knowledge on how to preserve the ocular health of medical student patients throughout the outbreak.

Aim of Study: This study aims to describe the prevalence of dry eye symptoms (DES) among medical students in coronavirus (COVID-19) outbreak. Then To evaluate the DES of medical students during corona waves and describe prevalence of eye problems among medical students during corona waves.

Patients and Methods: This is a Cross sectional study conducted among all Medical student of faculty of medicine assuit Al-Azhar University with Age >18 years old of both gender at the University Hospital of Faculty of Medicine Assuit Al-Azhar University. Patients demographics, medical and current history and symptoms of dry eye disease was obtained. OSDI score for every patient and correlation with depression, seeking medication and duration of mask wearing was noted.

Results: A total sample size of 80 medical students were included. Mean Age was 21.2 among participants, Males represented 38.75% and females represented 61.25%. Visual Display Terminal Duration mean was 15.5 and time spent on using computer and smartphone mean was 4.5. Blurred Vision was the most preserved DES symptom. There was no statistical difference between population showed dry eye symptoms (n=60) and those who did not show symptoms (n=20) regarding age, history of corneal refractive operation and history of use of contact lens. However there was a significant difference regarding gender, VDT exposure, duration of using protective glasses and time spent on using computer and smartphone. Also there was no statistical difference among different OSDI score groups regarding depression caused by dry eye or desire

for treatment. However, mask wearing duration showed a high significant difference among the groups. Most participants were moderate OSDI score (N=38) and most of them were wearing mask 3-6 per day.

Conclusion: Dry eye symptoms had increased during the pandemic. Dry eye prevalence and symptoms severity are associated more with prolonged VDT exposure and using mask. However, there is no statistical difference among different OSDI score groups regarding depression caused by dry eye or desire for treatment.

Key Words: *Visual Display – Dry eye disease – Medical students – COVID-19.*

Introduction

THE coronavirus disease 2019 (COVID-19) pandemic continues to make a huge and likely lasting impact on the global population and its health care systems. Ophthalmology practice has been changing rapidly to deal with increasing challenges [1-3].

During the first wave of global pandemic lockdowns (Spring 2020), elective procedures and non-urgent clinical appointments were cancelled in many countries. There may be wider implications for patients with chronic eye disease who were not able to be monitored because of pandemic restrictions and fear. Varied experiences regarding management and care delivery during the COVID-19 pandemic have been reported from around the world in subspecialties such as glaucoma, medical retina, neuroophthalmology, and uveitis. Perspectives in corneal transplantation and corneal cross-linking have also been reported [4,5].

However, little is known about managing ocular surface diseases during this time. Dry eye disease (DED) is a common ocular surface disorder that affects millions of people worldwide. The impact of DED on both quality of vision and quality of life is considerable. The profound changes to patient lifestyle during the pandemic cannot be underestimated [6].

Correspondence to: Dr. Hassan Shamselden Yousef,
E-Mail hassanetal@yahoo.com

Several studies have investigated ocular symptoms, including those of DED, since the COVID-19 pandemic began. These studies have focused on post-COVID-19 patients or random subjects (medical staff or university students) not on the general population of DED patients in clinical practice [7,8].

No studies in Egypt are available to describe effect of corona on eyes of medical students so this study will be conducted to provide us information on ways of maintaining ocular health of medical students during COVID-19 infection.

This study aims to describe the prevalence of dry eye symptoms (DES) among medical students in coronavirus (COVID-19) outbreak. Then To evaluate the DES of medical students during corona waves and describe prevalence of eye problems among medical students during corona waves.

Material and Methods

This is a Cross sectional study conducted among all Medical student of 80 student with Age >18 years old of both gender at the University Hospital of Faculty of Medicine, Assuit Al-Azhar University From August 2020 – Jan. 2021. The medical students who will be excluded from the study were Students with successive faculty days (<10d) or duration per day (<3h), Students with significant ocular and systemic diseases, Students using contact lens or undergone ocular surgery (including corneal refractive surgery) within the previous 6 months and student using Concomitant medications or topical eye drops that might influence the ocular surface cigarette or alcohol use. After the addition of 10% drop-out proportion, the sample size will be equal to 80 medical students. Patients' demographics and operative details were analyzed.

The OSDI was assess on a scale ranging from 0 to 100, with higher scores representing greater disability. Scores ≥ 13 indicate symptomatic dry eye, in which 13 to 22, 23 to 32, and 33 to 100 indicate mild, moderate, and severe presence of DES, respectively [9].

Statistical analysis: All continuous variables were expressed as median or mean and standard deviation which compared with independent-test or Mann-Whitney test as feasible, according to the type of distribution. Chi-square test or Fisher's exact test was used for categorical values as appropriate. Statistical software SPSS version 22.0 (Statistical Package for the Social Sciences) was used for statistical analysis. A p -value <0.05 was considered statistically significant.

Results

Table (1): Characteristics of the study population.

Variable	Value
Age mean (SD) Years	21.2 (2.8)
Gender:	
Male n (%)	31 (38.75)
Female n (%)	49 (61.25)
VDT exposure mean (SD) hours	15.5 (5.7)
DES symptoms n (%):	
Photophobia	8 (10)
Foreign body sensation	18 (22.5)
Ache	11 (13.75)
Blurred Vision	25 (31.25)
Duration of using protective glasses (Hours) mean (SD)	6.3(2.1)
History of corneal refractive operation n (%)	12 (15)
History of use of contact lens n (%)	16 (20)
Chronic Diseases n (%):	
DM	3 (3.75)
Hypertension	5 (6.25)
SLE	2 (2.5)
Allergic disease	16 (20)
Depression	4 (5)
Time spent on using computer and smartphone (Hours)	4.5 (1.1)

SD : Standard deviation. DM : Diabetes Mellitus.
VDT : Visual Display Terminal. SLE : Systemic Lupus
DES : Dry Eye Symptoms. Erythematosis.

In Table (1) Mean Age was 21.2 among participants, Males represented 38.75% and females represented 61.25%. Visual Display Terminal Duration mean was 15.5 and time spent on using computer and smartphone mean was 4.5. Blurred Vision was the most preserved DES symptom. Allergic diseases and anti-allergic using preserved frequently among study population.

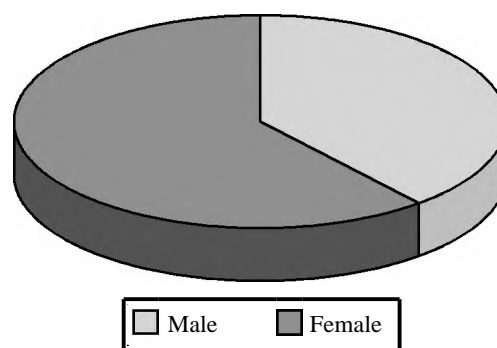


Fig. (1): Illustrates Male to Female ratio in the included study group.

Table (2): Comparison of normal participants and those with dry eye disease symptoms.

	DE symptoms N=60 (%)	No Symptoms N=20 (%)	P-value
Age mean (SD) Years	20.9 (2.6)	21.2 (2.8)	>0.05 ²
Gender:			
Male n (%)	19 (31.67)	12 (60)	<0.05 ^{*1}
Female n (%)	41 (68.33)	8 (40)	
VDT exposure mean (SD) hours	16.8 (6.9)	13.8 (4.1)	<0.05 ^{*2}
Duration of using protective glasses (Hours) mean (SD)	8.2 (3.2)	2.1(0.25)	<0.05 ^{*2}
History of corneal refractive operation n (%)	11 (18.33)	1 (5)	>0.05 ^{*1}
History of use of contact lens n (%)	14 (23.33)	1 (5)	>0.05 ^{*1}
Chronic Diseases n (%):			
DM	3 (5)	0	—
Hypertension	4 (6.67)	1 (5)	
SLE	2 (3.33)	0	
Allergic disease	14 (23.33)	2 (10)	
Depression	3 (5)	1 (5)	
Medications:			
Antiallergic:			
Antihypertensive	1 (1.67)	0	—
Antidepressants	2 (3.33)	1 (5)	
Oral contraceptives	2 (3.33)	0	

DE : Dry Eye. 1: Chi square Test.
 SD : Standard deviation. 2: U Test.
 VDT : Visual Display Terminal. *p is significant at <0.05.
 DES : Dry Eye Symptoms.
 DM : Diabetes Mellitus.
 SLE : Systemic Lupus Erythematosus.

According to Table (2) there was no statistical difference between population showed dry eye symptoms and those who did not show symptoms regarding age, history of corneal refractive operation and history of use of contact lens. However there was a significant difference regarding gender, VDT exposure, duration of using protective glasses and time spent on using computer and smartphone.

Table (3): OSDI score and questionnaire results among students with dry Eye symptoms.

	Mild N=14	Moderate N=38	Severe N=8	p-value
Depression caused by dry eye n (%)	2 (14.29)	22 (57.9)	6 (75)	>0.05
Desire for treatment n (%)	6 (42.86)	25 (65.79)	7 (87.5)	
Mask wearing duration n (%):				
<3 hours	10 (71.43)	3 (7.89)	1 (12.5)	<0.001
3-6 hours	3 (21.43)	25 (65.79)	2 (25)	
>6 hours	1 (7.14)	10 (26.32)	5 (62.5)	

Chi Square Test. *p is significant at <0.05.

According to Table (3) there was no statistical difference among different OSDI score groups regarding depression caused by dry eye or desire for treatment. However, mask wearing duration showed a high significant difference among the groups. Most participants were moderate OSDI score (N=38) and most of them were wearing mask 3-6 per day.

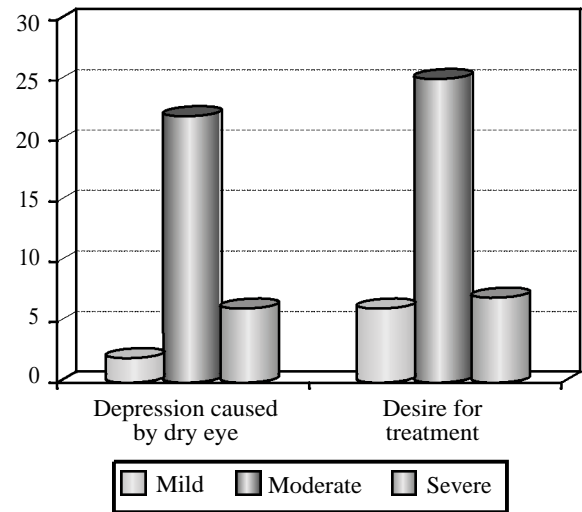


Fig. (2): Illustrates OSDI score and depression caused by dry eye and desire for treatment.

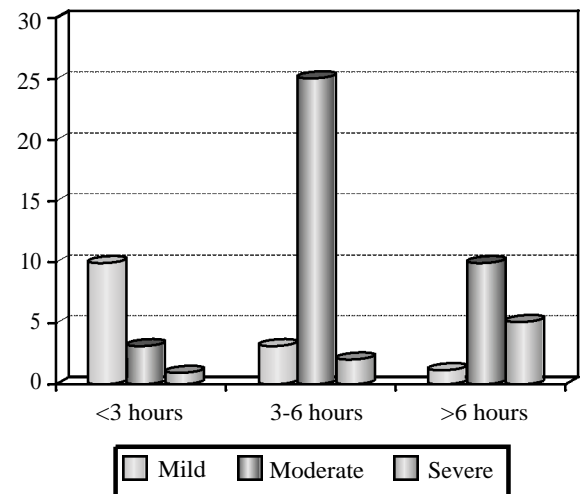


Fig. (3): Illustrates OSDI score and mask wearing duration.

Discussion

We found an extremely high frequency of DE symptoms among the participants in the present study; in fact, just 25% of the participants had normal results, whereas around a half of the participants had moderate symptoms. Also 13.3% of participants had DE diagnosed symptoms were with severe symptoms. Similar reports regarding DE prevalence were found in a recent study with population of a similar age range [10]. However,

The prevalence of severe symptoms among population of this study was higher than our as it reached 30% of population.

Frequency of DE symptoms among the participants is extremely high compared with the results of a previous large study in the United States that reported a prevalence of 3.4% in a population of a similar age range [11]. Also it is higher than a recent pre-corona Egyptian study [12].

In terms of DE among computer users in particular, a recently published meta-analysis estimated an overall prevalence of 49.5%, but the heterogeneity of the diagnostic criteria used for DE causes the interpretation of this value to be limited [13]. Nevertheless, there is vast evidence that the prevalence of DE among VDT users is higher than the 5%-33% reported for the general population [14].

The number of hours spent using a screen increased significantly to an average of almost 17 hours a day, which is extremely high compared with the eight hours a typical adult spends on VDT screens [15]. It has been previously reported that the use of VDT and engaging in learning activities for a prolonged period is associated with decreased blinking, thus producing DE symptoms [16].

We reported that there was no statistical difference among different OSDI score groups regarding depression caused by dry eye. Recent study goes against our results as it reported that depression was associated with DE symptoms in subjects with normal or mildly reduced tear production [17]. Another study reported close results to ours that depression is not the objective symptoms of dry eye [18].

Also in our study there was no statistical difference among different OSDI score groups regarding desire for treatment. A recent study during corona pandemic reported the same finding [19].

Mask wearing duration among our participants showed a high significant difference among the groups. Most individual reported wearing mask for less than 3 hours per day also reported lower OSDI score. A recent study reported that wearing a face mask longer than 3 hours per day, could contribute to or worsen DED symptoms during face mask-wear [20].

This study has some limitations. We did not evaluate signs of DE and there is a chance that the symptoms questionnaire may cover a wider range of symptoms that differ from DE. Although there are several factors related to the lock down includ-

ing psychological and environmental that may affect the results. Moreover, there is evidence that the symptoms of DE have a substantial impact on patients' quality of life [21]. Based on this, we suggest an extremely high incidence of undiagnosed DE symptoms that should be taken into account for developing educational measurements.

Conclusion:

Dry eye symptoms had increased during the pandemic. Dry eye prevalence and symptoms severity are associated more with prolonged VDT exposure and using mask. However, there is no statistical difference among different OSDI score groups regarding depression caused by dry eye or desire for treatment.

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الأعراض البصرية وجفاف العين بين طلاب الطب أثناء موجات كورونا فيروس

انتشار كورونا فيروس مستمر ليكون سبب كبير وطويل المدى على الحياة الطبيعية وأجهزة الرعاية الصحية.

أعراض جفاف العين من أكثر أمراض العيون انتشاراً ويؤثر على ملايين الناس حول العالم طرق عديدة وخبرات رعاية صحية في بعض التخصصات الدقيقة في أمراض العين مثل المياه الزرقاء وعلاج أمراض الشبكية وعلاج أعصاب العين والالتهابات القرنية تم توثيقها حول العالم أثناء الوباء.

ولعدم وجود دراسات في مصر توضح تأثيرات فيروس كورونا على عيون طلاب الطب هذه الدراسة سوف تؤخذ في الاعتبار لكي تعطينا معرفة كيفية حماية صحة مرضى كليات الطب أثناء.