

Prevalence of dry eye disease among Hail University staff and students.

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Abstract

Purpose: This study aimed to estimate the prevalence of dry eye disease among Hail University staff and students. To investigate the Dry Eye Disease (DED) associated risk factors among Hail University staff students.

Patients and methods: A cross sectional study was conducted in Hail University during February 2022 using an electronic-based Ocular Surface Index (OSDI) questionnaire.

Results: A total 350 university students and staff completed the survey questionnaire. Participants were classified according to four groups, about half (48.3%) of participants were suffered from dry eyes, 14.9% had mild DES, 8% had moderate DES and 25.4% had severe DES according to OSDI score.

Conclusion: DED is common among university students and staff. These findings highlight the continued importance of research and therapeutic development for this common condition.

Keywords: Dry eye disease, Dry eyes, Ocular surface disorder.

Introduction

Dry Eye Disease (DED) is a common ocular surface disorder that considered a public health problem due to its impact on vision-related quality of life of the affected subjects [1-3]. According to the recent official report of the International Dry Eye Workshop (DEWS 2017), that based on summary of the findings of current research, DED was defined as “Dry eye is a multi-factorial disease of the ocular surface characterized by a loss of homeostasis of the tear film, and accompanied by ocular symptoms, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities play etiological roles” [4]. Dry eye symptoms include eye dryness, foreign body sensation, and burning sensation, eye redness and discomfort. The condition is aggravated usually at hot, dry climate which is specifically relevant to Saudi Arabia [5-9]. In addition, early detection of dry eyes is important because it can indicate the presence of systemic diseases, such as systemic lupus erythematosus, rheumatoid arthritis, and Sjogren’s syndrome [10].

A review of the literature showed that the prevalence of DED in the Middle East has not been frequently studied. However, according to the few studies reported in the region; the prevalence was noticeably high. For example, in the Kingdom of Saudi Arabia (KSA), DED was reported at a prevalence of 93.2% in one city on the basis of presence of one or more DED symptoms occurring often or most of the time, along with presence of one or more of the dryness signs revealed by clinical tests [1]. Some studies have found an association between smoking, wearing contact lenses, the amount of daily screen time, and dry eyes [11,12]. Approximately 5%-50% of world’s population is affected by this condition [14]. Asian countries (e.g. Japan, Korea, Thailand, and China) have been

found to have higher prevalence of DED compared to other countries in America and Europe [15-21]. There are few published articles related to the prevalence of dry eyes in Hail city, Saudi Arabia, and none were found in Hail university population. Therefore, this study is the first to estimate both the scope and the burden of the disease in Hail university population. It is vital to identify the prevalence and severity of dry eyes to suggest future public health measures that can raise awareness and explore ways to alleviate dry eyes. Our study aimed to explore the prevalence and potential risk factors of DED among students and staff at Hail University, Hail.

Methodology

Study setting, study participants and study design

Study was conducted in Public Sector University. This is the cross-sectional study.

Sampling technique and sample size

The participants selected through convenient sampling technique. Sample size calculated from world health organization sample size calculator for health studies software, 5% margin of error with 95% Confidence interval, 35% prevalence of dry eye from previous study, the required sample size is 350.

Data collection procedure and study instruments

This study was approved by ethics committee at University of Hail. The questionnaires distributed among study participants electronically. A validated, and structured questionnaire will be used, the internal validity and reliability of questionnaire has

been found very high [8,11]. The reliability of the items in each domain and overall was assessed using Cronbach’s alpha coefficients at a 95% CI and value of the tool was 0.78 (95% CI: 0.76-0.81). The questionnaire had pretested, find out any inconsistency of responses and modification of questionnaire according to response from study participants, and build a final version of questionnaire.

The OSDI questionnaire on dry eye symptoms was used and translated into Arabic. There are two section of questionnaire, first is the Socio-demographic data and medical history of each participant.

Scoring

The grading used was on a scale from 0 to 4, where 0 denoted none; 1: Some; 2: Half; 3: Most; and 4: All of the time. The total score is commonly estimated on the basis of the following formula; OSDI=[sum of the scores for all questions answered × 100]/total number of questions answered] × 4 [16]. The contribution of contact lenses to the pathology, incidence and severity of the DES was studied to determine the frequency of these events. The total score was calculated on a scale of 0 to 100, with higher scores representing greater distress. Scores 0 to 12 representing normal, 13 to 22 representing mild dry eye disease, 23 to 32 representing moderate dry eye disease, and greater than 33 representing severe dry eye disease.

Statistical analysis

Data analysis was done in Statistical Package of Social Science Software program (SPSS) version 22.0 software (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp). Descriptive statistics in the form of mean, standard deviation, frequency, and percentage used for data summarization, OSD scores was converted into categories i.e. mild, moderate, severe Inferential statistical analysis used by logistic regression models to test association of risk factors of dry eye with the OSD score. P-value of <0.05 will be considered as statistical significance.

Results

Characteristics of study participants

Mean age of study participants was 23.58 ± 1.51 SD, most (83.1%) of them were students and 56.3% were male students. Few (2.9% and 4.3%) of participants were have diabetes and Thyroid dysfunction. Fifteen percent participants were used contact lenses (Table 1).

Characteristics	Frequency (%)
Age (Years) (Mean ± SD)	23.48 ± 1.51
18-20	165 (47.1)
21-60	185 (52.9)
Gender	
Male	197 (56.3)

Female	153 (43.7)
Smoking	
Ever	49 (14)
Never	301 (86)
Occupation	
Students	291 (83.1)
Employee	59 (16.9)
Diabetes Mellitus(DM)	
Yes	10 (2.9)
No	340 (97.1)
Thyroid Dysfunction(TD)	
Yes	15 (4.3)
No	335 (95.7)
Past Surgical History of Eye	
Yes	17 (4.9)
No	333 (95.1)
Contact Lens Use	
Yes	54 (15.4)
No	296 (94.6)

Table 1. Clinical and demographic characteristics of study participants (n=350).

Prevalence of dry eye among study participants

Participants were classified according to four groups, about half (48.3%) of participants were suffered from dry eyes, 14.9% had mild DES, 8% had moderate DES and 25.4% had severe DES according to OSDI score (Figure 1).

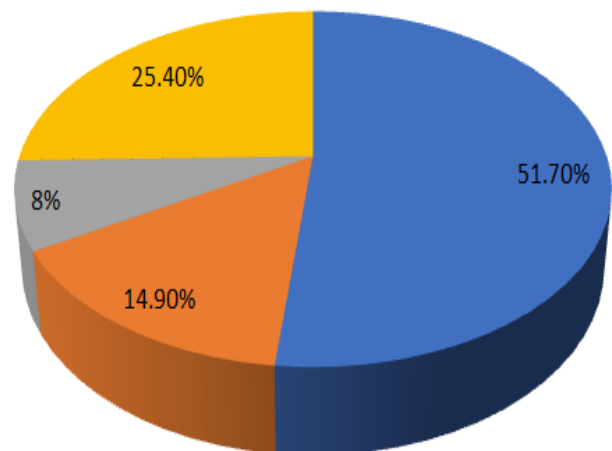


Figure 1. Prevalence of dry eye among study participants, according to OSD scale.

Note: ■ Normal ■ Mild ■ Moderate ■ Severe

Prevalence of dry eye among students and university employee

Nearly half (49.8%) of students were had DES and 40.7% of employee were had DES according to OSDI score (Figure 2).

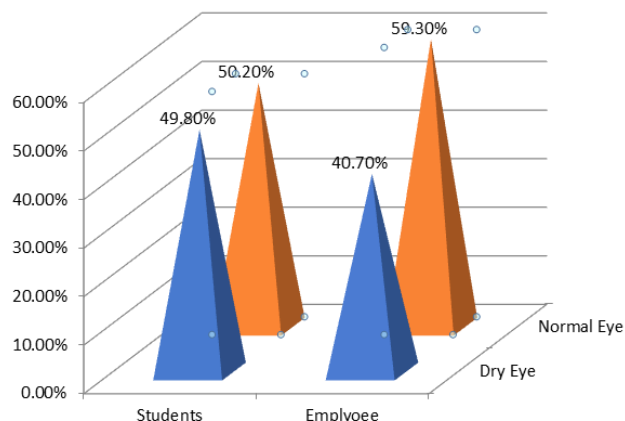


Figure 2. Prevalence of dry eye among students and employee.

Note: ■ Dry eye ■ Normal eye.

Risk factors affecting the prevalence of DES

Logistic regression test used to study the association between risk factors and eye dryness, there was no statically significant association between those risk factors variables and dry eyes (Table 2).

Characteristics	Dry eyes un-adjusted Odd Ratio OR (95% Confidence Interval CI) (p-value)	Dry eyes adjusted odd Ratio OR (95% Confidence Interval CI)
Age category (years)		
18-20	1	1
21-60	1.22 (0.80-1.85) (0.354)	1.14 (0.72-1.82) (0.561)
Gender		
Female	1	1
Male	1.15 (0.75-1.76) (0.501)	0.98 (0.60-1.60) (0.949)
Smoking		
Ever	1	1
Never	1.06 (0.58-1.95) (0.839)	0.93 (0.48-1.78) (0.833)
Occupation		
Student	1	1
Employee	4.54 (2.81-7.98) (0.030)	1.35 (0.72-2.54) (0.341)
Contact lens use		
No	1	1
Yes	1.54 (0.85-2.72) (0.147)	0.62 (0.32-1.18) (0.151)
LASIK operation		
No	1	1

Yes	1.75 (0.63-4.86) (0.277)	1.51 (0.52-4.34) (0.442)
Diabetes		
No	1	1
Yes	1.41 (0.39-5.10) (0.596)	1.17 (0.31-4.45) (0.813)
Thyroid dysfunction		
No	1	
Yes	1.64 (0.57-4.71) 0.358	1.96 (0.66-5.83) (0.222)

Table 2. Association of dry eyes with risk factors among study participants (n=350).

Discussion

Few studies have investigated the prevalence of DED in Hail city. This is the first population-based study regarding prevalence of DED in Hail University population. In the study, the OSDI questionnaire was used to assess the presence of symptomatic DED.

The current study participants were classified according to four groups, about half (48.3%) of participants were suffered from dry eyes, 14.9% had mild DES, 8% had moderate DES and 25.4% had severe DES according to OSDI score. In comparison with other dry eye disease epidemiological surveys that also adopted the same DED diagnostic criteria based on OSDI questionnaires, a study focusing on the prevalence of DED among Mexican high school students revealed that 65.3% of the students suffered from symptomatic DED [23]. The prevalence reported in our study was higher than that in the above-mentioned study.

Considering the high prevalence of DED among Hail university population in the current study, we speculated that it may attribute to long online courses and heavy stress. The high prevalence might be attributed to several factors mainly related to the arid climate with temperature ranging from 30 to 40°C during summer seasons. Selection bias is a limitation of the study as it was limited to Hail university population who could access the internet, which limits the generalizability of our results. This study aimed to explore the prevalence of dry eye disease among Hail University staff and students, and to investigate the Dry Eye Disease (DED) associated risk factors among Hail university staff students.

Further research is recommended to better understand other potential risk factors associated Dry Eye Disease (DED), and answering other potential among society. Finally, this is the first study of the prevalence of DED in a previously unstudied population in Hail university population. It was found that the prevalence of DED is relatively high in this study. An attempt should be performed to increase the awareness of the society with DED, so modifiable risk factors can be reduced. However, further research is required to better understand other potential risk factors associated with DED including; impact of arid environment, drug use, systemic diseases and anxiety.

Conclusion

In conclusion, this is the first study of the prevalence of DED in a previously unstudied population in Hail university population. It was found that the prevalence of DED is relatively high in this study. An attempt should be performed to increase the awareness of the society with DED, so modifiable risk factors can be reduced. However, further research is required to better understand other potential risk factors associated with DED.

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