

The association between personality traits and dry eye disease: A cross-sectional study

Kaberi B. Feroze¹, Zahrah A.M. AlAbdullah¹, Arwa H.A. AlOnayzan¹, Abdulwahab Pattath²

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Abstract:

PURPOSE: Dry eye disease (DED) is a growing public health concern that causes significant visual disability and interferes with the quality of life. The aim of the study is to analyze the relationship between personality traits and DED symptoms in the eastern region of Saudi Arabia.

METHODS: A cross-sectional study was carried out in the Eastern Province of Saudi Arabia in 2018. A total of 613 subjects participated in this study. Ocular surface disease index was first distributed online to assess the subjective symptoms of DED. Then, persons with DED were selectively chosen to be tested by the Big Personality Trait Inventory questionnaire. Data were analyzed using one-way ANOVA test at a level of significance, $P < 0.05$.

RESULTS: 57.7% of the patients reported symptoms of DED. There was a significant positive correlation between DED and neuroticism personality trait. DED severity was found to be significantly correlated in persons with chronic diseases.

CONCLUSION: This study suggests that psychological problems have an impact on DEDs in a way that needed to be studied.

Keywords:

Personality traits, Dry eye disease, Saudi Arabia

INTRODUCTION

Dry eye disease (DED) is a growing public health concern. It causes ocular discomfort, fatigue, and visual disturbance that interferes with the quality of life (QoL).^[1] A study investigated the impact of DED on QoL and vision, highlighting that DED is one of the most prevalent ocular surface diseases in the world.^[1] It is also reported that 25% of the patients who visit ophthalmic clinics report symptoms of dry eye.^[2] Moreover, it is stated that DED is the most common condition seen by eye care practitioners.^[2]

According to the International Dry Eye WorkShop in 2007, “DED is a multifactorial disease of the tear and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface.”^[3] DED is considered to be asymptomatic disease,^[4] and many patients with DED experience eye irritation, stinging, dryness, ocular fatigue, and fluctuating vision.^[5]

Personality is the dynamic organization within the individual of those psychophysical systems that determine the characteristic behavior and thought.^[6] Psychological status affects human life and makes a person prone to some of the illnesses. In general, people have different personality traits, leading to different pattern of responses to various conditions and situations.

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¹Departments of Ophthalmology and
²Neuroscience, King Faisal University, College of Medicine, Faisal University, Al Al-Ahsa, Saudi Arabia

Address for correspondence:
Dr. Zahrah Ahmed Mohammed AlAbdullah,
Department of Ophthalmology, King Faisal University, Al-Ahsa, Saudi Arabia.
E-mail: zahrah29@hotmail.com

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Studies have shown that psychological factors are associated with DED symptoms.^[7] It is reported that the psychological status influences the subjective symptoms of DED; however, little is known about the influence of personality traits.^[8] It is well known that personality traits play an important role in a person’s psychological status.^[9] However, until now, there have been no studies in Arab countries, particularly Saudi Arabia, about the relationship between the personality traits and the subjective symptoms of DED. The current study aimed to analyze the relationship between personality traits and DED symptoms in Saudi Arabia.

METHODS

A cross-sectional study was carried out in the Eastern Province of Saudi Arabia between 2017 and 2018. The study population is Saudi citizens in the age group of 18–65 years. The sample size is 613. Participants were randomly selected by filling out a questionnaire completely. Participants who have dry eye symptoms were included in the reported study.

Inclusion criteria

- Saudi citizens aged 18–65 years.

Exclusion criteria

- Non-Saudi citizens, patients with history of ocular diseases, and patients having surgeries.

Ethical consideration

This research was approved ethically by research and the medical ethical committee of the College of Medicine at King Faisal University. The study was conducted using questionnaires distributed online.

Dry eye symptom questionnaire

Ocular surface disease index (OSDI) was electronically distributed to assess the subjective symptoms of DED in the Al-Ahsa region, Saudi Arabia. Permission was granted to use the OSDI questionnaire by contacting the official website research, and it was provided in the Arabic version. It consists of 12 items that assess symptoms, functional limitations, and environmental factors related to dry eye, graded on a scale of 0 to 4. Zero score means none of the time, 1 means some of the time, 2 means half of the time, 3 means most of the time, and 4 means all of the time. The scores range from 0 to 100. According to the final score, the patient’s symptoms can be categorized: normal (0–12), mild dry eye (13–22), moderate dry eye (23–32), and severe dry eye (33–100).

Personality evaluation

After assessing the subjective symptoms of DED by OSDI, the subjects were required to fill the Arabic version of the Big Five Personality Inventory electronically. Permission was granted to use the Big Five Personality Inventory by contacting the official website research. The Big Five Personality Inventory has 44 items that evaluate personality according to the five main factors of extraversion, agreeableness, conscientiousness, neuroticism, and openness.

Statistical analysis

The collected data were coded, tabulated, and statistically analyzed using IBM SPSS statistics, version 21 Armonk, NY, IBM CORP.

Descriptive statistics were done as minimum and maximum of the range for quantitative data as well as mean ± standard deviation for quantitative normally distributed data, while it was done as number and percentage for qualitative data.

Inferential analyses were done for quantitative variables using one-way ANOVA test (two-tailed) at 95% confidence interval to find out the comparison of means; Pearson’s correlation test was run to demonstrate the correlation between the degree of dry eye and personality traits. The level of significance was taken at a $P < 0.05$.

RESULTS

The mean age of the patients was 29.78 ± 10.84 years, 172 (28%) are males, and 442 (72%) are females.

57% of the patients reported having symptoms of dry eye; 42.2% were normal, 35.8% were suffering from mild, 16.0% moderate, and 5.9% severe degree of dry eye [Table 1].

Dry eye severity was found to be significantly correlated with a history of chronic diseases.

Table 2 shows the results after excluding patients with chronic diseases; 519 participants have no chronic diseases.

It is found that there is a statistically significant correlation between cases that do not have any current chronic diseases and the degree of dry eye: $P = 0.001$ and $P < 0.05$, respectively [Table 3].

Table 1: Pearson’s correlation between degree of dry eye and neuroticism correlation

	Degree of dry eye	Neuroticism
Degree of dry eye		
Pearson’s correlation	1	0.140**
Significant (two-tailed)		0.001
<i>n</i>	613	613
Neuroticism		
Pearson’s correlation	0.140**	1
Significant (two-tailed)	0.001	
<i>n</i>	613	613

**Correlation is significant at the 0.01 level (two-tailed)

Table 2: Degree of dry eye in cases do not have chronic diseases

Degree of dry eye × do you have chronic disease cross-tabulation			
Count	Do you have chronic disease		Total
	Yes	No	
Degree of dry eye			
Normal	29	230	259
Mild	30	190	220
Moderate	26	72	98
Severe	9	27	36
Total	94	519	613

A statistically significant positive correlation between the degree of dry eye and neuroticism was found with $P < 0.05$, $r^2 = 0.089$, by Pearson's two-tailed correlation test [Table 4 and Figure 1].

However, no statistically significant correlation between degrees of dry eye and agreeableness, extraversion, openness, nor conscientiousness was found.

Neuroticism is significantly correlated with the symptoms of dry eye, with $P < 0.05$ at 95% confidence interval by one-way ANOVA test.

However, no correlation was found between dry eye symptoms and other personality traits [Table 4].

DISCUSSION

The main drawback of this study is that it focuses primarily on the dry eye symptoms to grade the severity of the disease.

As mentioned earlier, 57.7% out of 613 of the subjects reported symptoms of DED and 42.3% did not report any dry eye symptoms.

A Saudi Arabian study shows the prevalence of DED as 32.1% out of all eye diseases,^[10] while another study in the western region of Saudi Arabia shows a 93.2% DED prevalence.^[11] However, in this study, 35.9% of the participants reported having mild, 16% moderate, and 5.9% severe DED symptoms.

No significant correlation was found between gender and the degree of DED.

There is a strong female predominance in the sample because 442 out of 613 of females fill the questionnaire.

There is a similar Saudi Arabian study, which also followed the same pattern as this study^[11] but has different results showing a significant association between DED and gender.^[10]

DED severity was found to be significantly correlated with a history of diabetes mellitus. This is similar to a

study conducted in Al-Ahsa region^[10] and other studies elsewhere.^[12,13]

A UK study found traits of neuroticism and openness to be significant predictors of self-reporting of ocular conditions.^[14] Depression, anxiety, and abnormalities in sleep patterns were found to be common in DED patients than in the general population, with the highest prevalence among patients with primary Sjogren's syndrome.^[15,16] Patients with primary Sjogren's syndrome are also found to have attention and short-term memory deficits.^[17]

It is well known that personality traits do play an important role in a person's psychological status.^[18] Studies reported that patients with depression are at a high risk of developing DED. Conversely, patients with DED were also more likely to have depression.^[19]

This study is the first of its kind in this region, investigating the influence of personality traits on DED symptoms in Saudi Arabia as concluded after searching on various databases such as PubMed and Cochrane. DED is highly prevalent in Saudi

Table 3: Pearson's Chi-square test between those having chronic diseases and those who do not regarding degree of dry eye

	Value	df	Asymptotic significant (two-sided)
Pearson's Chi-square	15.956 ^a	3	0.001
Likelihood ratio	14.547	3	0.002
Linear-by-linear association	12.930	1	0.000
Number of valid cases	613		

^a0 cells (0.0%) have expected count <5. The minimum expected count is 5.52

Table 4: Correlation between personality trait and dry eye

	ANOVA				
	Sum of Squares	Df	Mean Square	F	Sig.
Extraversion					
Between Groups	1.231	3	0.410	1.407	0.240
Within Groups	177.522	609	0.291		
Total	178.753	612			
Agreeableness					
Between Groups	0.335	3	0.112	0.531	0.661
Within Groups	128.193	609	0.210		
Total	128.528	612			
Conscientiousness					
Between Groups	0.592	3	0.197	0.760	0.517
Within Groups	158.201	609	0.260		
Total	158.793	612			
Neuroticism					
Between Groups	6.146	3	2.049	4.965	0.002
Within Groups	251.274	609	0.413		
Total	257.420	612			
Openness					
Between Groups	1.127	3	0.376	1.316	0.268
Within Groups	173.888	609	0.286		
Total	175.015	612			

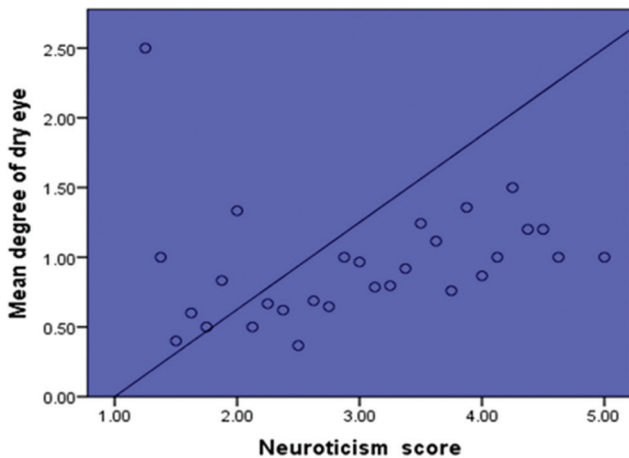


Figure 1: A positive direct linear correlation between neuroticism score and mean degree of dry eye

Arabia, and it has a significant impact on the QoL. Our study shows a positive correlation between chronic diseases and the personality neuroticism trait with DED.

CONCLUSION

It is recommended that further population-based studies should be conducted to know more about the psychological impact of DED. More psychological studies are needed to study the influence of personality on patients with DED, as well as the effect on DED on the mental health of patients suffering from DED. A broader study with more subjects and including a physical examination of DED patients is planned.

Although the effects of DED on physical and occupational health are well known, the effect of this condition on mental health is largely ignored. Mental well-being is a very important contributing factor to the general well-being and the QoL of an individual.

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Conflicts of interest

There are no conflicts of interest.

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