

Knowledge and Practice Regarding Dry Eye among General Population in Aseer Region, Southwestern, KSA

Abdul-Rahman Alamri, MD* Fatimah Jaber Ahmad Ghazwani, MD** Lamia Saeed Abdulrahman Al Ghaseb** Sarah Rushdi Abdullah Khanfor** Rahaf Abdullah Mohammed Almutiq**

ABSTRACT

Design: Descriptive cross section study.

Background: Dry eye disease (also known as dry eye syndrome) refers to a group of disorders of the tear film that are due to reduced tear production or tear film instability, associated with ocular discomfort and/or visual symptoms and inflammatory disease of the ocular surface. The patient population includes individuals of all ages who present with symptoms and signs suggestive of dry eye, such as ocular irritation, redness, mucus discharge, fluctuating vision, and decreased tear meniscus or plugged meibomian glands.

Methods: Descriptive cross section study to detect Knowledge and awareness of ocular allergy among community in Aseer region, KSA by self-filling online questionnaire and also sociodemographic data among the general population. Data was obtained from purposely constructed questionnaire. Data was entered in SPSS ver.20 software for analysis chi-square test was used at 5.00% level of significance. Consent for participation was obtained.

Results: A total of 494 participants fulfilling the inclusion criteria completed the study questionnaire. Participants' ages ranged from 18 to 65 years with mean age of $29.6 \pm .4$ years old. Exact of 306 (61.9%) of the respondents were females. As for education, 382 (77.3%) were university graduated and 84 (17%) had secondary level of education.

Conclusion: To conclude, dry eye syndrome affects the majority of people and is primarily caused by their regular activities. In order to provide greater prospects for improved medical management.

Keywords: Dry, Eye, People, Awareness

INTRODUCTION

Dry eye disease (also known as dry eye syndrome) refers to a group of disorders of the tear film that are due to reduced tear production or tear film instability, associated with ocular discomfort and/or visual symptoms and inflammatory disease of the ocular surface. The patient population includes individuals of all ages who present with symptoms and signs suggestive of dry eye, such as ocular irritation, redness, mucus discharge, fluctuating vision, and decreased tear meniscus or plugged meibomian glands¹.

Estimates of DED prevalence in the general population varied greatly between studies, ranging from 5% to 50%. The large variation not only comes from the heterogeneous characteristics of investigated population, but also stems from the disparities of diagnostic criteria and evaluation methods. Despite the diverse diagnostic procedure of DED, several crucial risk factors have been recognized. However, current studies reporting risk factors for DED have mainly focused on demographic and behavioral factors, for example, female sex, advanced age, contact lens wear, and visual display terminal usage. Economic status is one of the crucial social determinants of health, and as such, it has a non-negligible influence on the risk of numerous health problems². Based on data from the National Health and Wellness Survey, 6.8 percent of the United States adult population (approximately 16.4 million people) have been diagnosed with DED. The prevalence increased with age (2.7 percent in those 18 to 34 years old versus 18.6 percent in those ≥ 75 years old) and was higher in women than men (8.8 versus 4.5 percent).

Prevalence was not affected by education or location of residence³.

Dry eye disease (DED) is a growing public health concern causing ocular discomfort, fatigue and visual disturbance that interferes with quality of life, including aspects of physical, social, psychological functioning, daily activities and workplace productivity. DED also impacts other aspects in the everyday quality of life of patients, including physical, social, psychological, and workplace productivity. The physical impact of DED seems most closely related to the concept of DED as a type of chronic pain syndrome, which results in chronic symptoms of ocular surface discomfort with subsequent effects on a number of aspects of quality of life⁴.

Previous study performed in China 2014 showed Twelve out of the 9 identified studies were included in the meta-analysis. The pooled prevalence of DES in China was 17.0%. Female individuals, subjects living in the Northern and Western China, and over 60 years of age had significantly higher prevalent rates (21.6%, 17.9%, 31.3%, and 34.4%, resp.) compared with their counterparts. Patients with diabetes were also found to be more vulnerable to DES⁵. Another study conducted in 2018 included 621 participants aged between 15 and 80 years from western KSA. Results of study showed that all participants suffering from (DES). No significant relation between age and gender were found. Results indicated that there is a high prevalence of (DES). Concerned must be increased about people knowledge regarding (DES) causes and symptoms⁶.

* Professor
Department of Ophthalmology, King Khalid University, Saudi Arabia.
E-mail: profalamri@hotmail.com

** Medical Student

According to recent study done in 2020 showed that Seven hundred sixty-nine subjects were recruited from the general non-clinical population in the West Bank. The mean age of participants was 43.61±18.57 years ranging from 18 to 90 years. Females constitute 52.7% of the study population. Based on the diagnostic criteria, the prevalence of DED was 64% (95% confidence interval 60.6–67.3). DED was significantly associated with female gender $p = (0.001)$ and older age $p = (0.001)$ ⁷. The main aim of this study is to assess the level of awareness and knowledge of dry eye syndrome among population in southern region of Saudi Arabia. For our knowledge there were NO study to evaluate the knowledge and practice of people toward this disease in Aseer region, southwestern, KSA up to date.

METHODOLOGY

Study Design: Descriptive cross section study to detect Knowledge and awareness of ocular allergy among community in Aseer region, KSA by self-filling online questionnaire and also socio demographics data among the general population.

Study Setting: Aseer region Southwestern, KSA.

Study Population: 500 of general population in Aseer region

Data Analysis: After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was statistically significant. For knowledge and awareness items, each correct answer was scored one point and total summation of the discrete scores of the different items was calculated. A participant with score less than 60% (35 points) of the maximum score was considered to have poor awareness while good awareness was considered if he had score of 60% (36 points or more) of the maximum or more. Descriptive analysis based on frequency and percent distribution was done for all variables including participants age, gender, education level, job title, and knowledge and awareness items including causes, signs and symptoms, preventive measures, treatment modalities, and consequences of dry eye. Cross tabulation was used to assess distribution of awareness level according to participants' personal data and source of information. Relations were tested using Pearson chi-square test and exact probability test for small frequency distributions.

RESULTS

A total of 494 participants fulfilling the inclusion criteria completed the study questionnaire. Participants' ages ranged from 18 to 65 years with mean age of 29.6 ± .4 years old. Exact of 306 (61.9%) of the respondents were females. As for education, 382 (77.3%) were university graduated and 84 (17%) had secondary level of education. Considering work, 198 (40.1%) were employed, 171 (34.6%) were students while 92 (18.6%) were unemployed. Exact of 201 (40.7%) of the respondent had family member complained of dry eye, while 171 (34.6%) had none. Also, 435 (88.1%) participants reported that they previously heard about dry eye (Table 1).

Table 1: Socio-demographic data of study participants, Aseer Region, Southwestern, KSA

Socio-demographic data	No	%
Age in years		
< 20	36	7.3%
21-30	237	48.0%
31-40	92	18.6%

41-50	85	17.2%
> 50	44	8.9%
Gender		
Male	188	38.1%
Female	306	61.9%
Education		
Below secondary	28	5.7%
Secondary	84	17.0%
University	382	77.3%
Work		
Unemployed	92	18.6%
Student	171	34.6%
Employed	198	40.1%
Retired	33	6.7%
Do you know anyone with dry eyes?		
Family member	201	40.7%
Relative	53	10.7%
Friend	40	8.1%
Others	29	5.9%
None	171	34.6%
Previously heard about dry eye		
Yes	435	88.1%
No	59	.9%

Table 2 illustrates distribution of participants awareness regarding causes and aggravating factors of dry eye. As for causes of eye dryness, sitting in front of screens for long hours was the most identified by study participants (54.7%), followed by eye allergy (43.1%), Wind, fumes or dry air (41.3%), Use contact lenses (38.9%), old age (33.8%), Undergoing an eye surgery such as LASIK (33%), Lack of eye tears (31.6%), and some drugs (26.9%). The least reported causes were Vitamin A deficiency (9.7%), and Blepharitis (0.2%). With regards to Chronic diseases that cause dry eyes, 49.4% of the participants know about eye allergy, followed by Sjogren syndrome (17.8%), Vitamin A deficiency (14.6%), Thyroid disorders (.1%), SLE (10.7%), and Rheumatoid arthritis (7.1%). Considering Medicines may cause dry eyes, 15% of the respondents know about Antihistamines, followed by Antihypertensive drugs (7.5%), Bronchodilators (6.9%), Cocaine (6.5%), Decongestants (5.1%), and Antidepressants (5.1%). About Factors increase eye dryness, Storms or winds were the most reported (66.8%), followed by Dry or low humidity areas (70.9%), and Air-conditioned places (34%).

Table 2: Distribution of participants awareness regarding causes and aggravating factors of dry eye

Factors	No	%
Causes of eye dryness		
Sitting in front of screens for long hours	270	54.7%
Eye allergy	213	43.1%
Wind, fumes or dry air	204	41.3%
Use contact lenses	192	38.9%
Old age	167	33.8%
Undergoing an eye surgery such as LASIK.	163	33.0%
Lack of eye tears	156	31.6%
Some drugs	133	26.9%
Chronic diseases	129	26.1%
Lack of eyelashes	122	24.7%
Vitamin A deficiency	48	9.7%
Blepharitis	1	.2%

Chronic diseases that cause dry eyes?		
Eye allergy	244	49.4%
Sjogren syndrome	88	17.8%
Vitamin A deficiency	72	14.6%
Thyroid disorders	55	.1%
SLE	53	10.7%
Rheumatoid arthritis	35	7.1%
Dont know	222	44.9%
Medicines may cause dry eyes		
Antihistamines	74	15.0%
Antihypertensive	37	7.5%
Bronchodilators	34	6.9%
Cocaine	32	6.5%
Decongestants	25	5.1%
Antidepressants	25	5.1%
Dont know	384	77.7%
Factors increase eye dryness		
Storms or winds	330	66.8%
Dry or low humidity areas	350	70.9%
Air-conditioned places	168	34.0%

Figure 1 shows distribution of study participants' knowledge regarding clinical symptoms of and signs of dry eye. The most known signs and symptoms were dryness sensation (76%), followed by itching (62%), burning sensation (57%), redness (55%), pain (42%), feeling of FB inside the eye (34%), photosensitivity (27%), and weak vision (26%). The least identified were increased tears secretion (16%), and strands of mucus in or around the eye (9%).

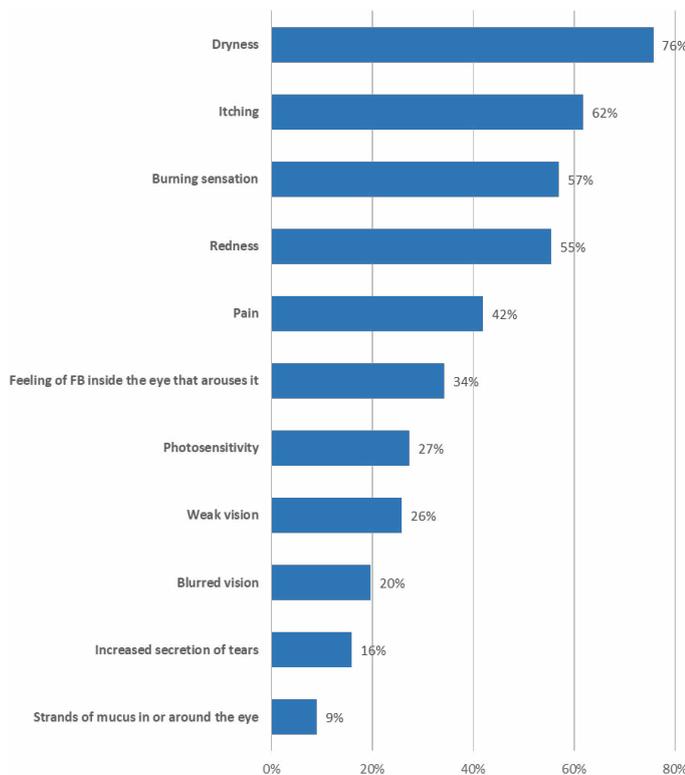


Figure 1: Distribution of study participants' knowledge regarding clinical symptoms of and signs of dry eye

Table 3 demonstrates distribution of study participants' knowledge regarding cli preventive measures and treatment of dry eye. Exact of 77.9% of the study participants know that Dry eyes require a visit to

the ophthalmologist while only 52% know it is a preventable disease. As for methods to reduce or avoid dry eyes, the mot known among participants were Moisturizing eye drops (84%), followed by Give the eye breaks while performing tasks that require a long time (70.6%), Avoid air, whether from air conditioning or hair dryer, or avoid wind and dust as much as possible (45.5%) Get enough sleep (44.1%), Stay hydrated and drink fluids (42.5%), and Replacing contact lenses with eyeglasses (34%). The least known methods were Avoid smoking and smoking places (22.7%), and humidify the air at work and at home (21.7%). Also, 69.8% of the study respondents know that dry eye is a treatable disease. The most known treatment methods were Use of artificial tears (moisturizing drops) (64.2%), followed by Medicines to increase tear production (23.1%), Blocking the lacrimal ducts to preserve the natural tears as long as possible (9.3%), while 3.2% think that no available treatment for dry eye.

Table 3: Distribution of study participants' knowledge regarding cli preventive measures and treatment of dry eye

Preventive measures and treatment of dry eye	No	%
Dry eyes require a visit to the ophthalmologist?		
Yes	385	77.9%
No	14	2.8%
May be	80	16.2%
Dont know	15	3.0%
Dry eye is a preventable disease		
Yes	257	52.0%
No	28	5.7%
May be	140	28.3%
Dont know	69	14.0%
How to reduce or avoid dry eyes		
Moisturizing eye drops	415	84.0%
Give the eye breaks while performing tasks that require a long time	349	70.6%
Avoid air, whether from air conditioning or hair dryer, or avoid wind and dust as much as possible	225	45.5%
Get enough sleep	218	44.1%
Stay hydrated and drink fluids	210	42.5%
Replacing contact lenses with eyeglasses	168	34.0%
Warm or cold compresses may improve dry eyes	9	24.1%
Avoid smoking and smoking places	2	22.7%
Humidify the air at work and at home	107	21.7%
Dry eye is a treatable disease		
Yes	345	69.8%
No	5	1.0%
May be	99	20.0%
Dont know	45	9.1%
Possible treatment for dry eyes		
Use of artificial tears (moisturizing drops)	317	64.2%
Medicines to increase tear production	4	23.1%
Blocking the lacrimal ducts to preserve the natural tears as long as possible	46	9.3%
No available treatment	16	3.2%
Dont know	161	32.6%

Table 4 reveals distribution of study participants' knowledge regarding consequences of dry eye. Exact of 78.5% of the participants know that dry eyes affect reading ability, while 58.3% reported it can affect night driving, and 66.6% told it can affect TV watching. The most reported consequences of neglected dry eyes were Corneal ulceration (44.9%), followed by Conjunctivitis (32.4%), and Blindness (20%).

Table 4: Distribution of study participants' knowledge regarding consequences of dry eye

Effect	No	%
Eye dryness can affect		
Reading	388	78.5%
Night driving	288	58.3%
TV watching	329	66.6%
Neglected dry eyes may cause		
Corneal ulceration	222	44.9%
Conjunctivitis	160	32.4%
Blindness	99	20.0%
Dont know	215	43.5%

Figure 2 shows overall knowledge level regarding dry eye and its related clinical factors among study participants, Aseer region, Saudi Arabia. Exact of 451 (91.3%) participants had poor knowledge level regarding dry eye while only 43 (8.7%) had good awareness level with an average knowledge score of 21.9 ± 9.0 out of 60 points.

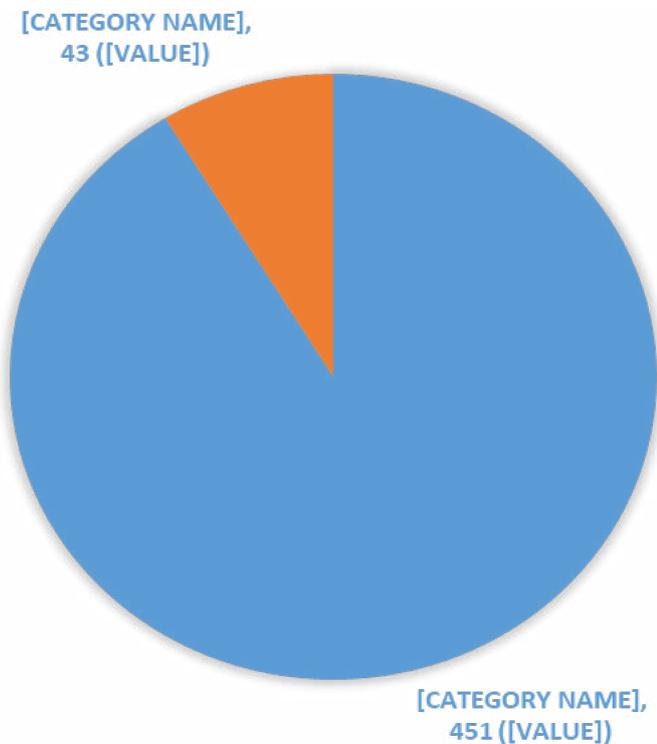


Figure 2: Overall knowledge level regarding dry eye and its related clinical factors among study participants, Aseer region, Saudi Arabia

Table 5 illustrates distribution of study participants awareness regarding dry eye by their bio-demographic data. Exact of % of university graduated participants had good knowledge compared to none of lower educated group with statistically significant difference ($P=.004$). Also, 13.5% of the students had good knowledge level regarding dry eye in comparison to 4.3% of unemployed and none of retired respondents ($P=.016$). Good knowledge was detected among 9.7% of participants who **previously heard about eye dryness** compared to 1.7% of those who did not ($P=.042$). Also, 14.9% of participants who had their information from mass media had good knowledge level compared to 12.7% of those who had from doctors, and 2.3% of those who had no source of information ($P=.001$).

Table 5: Distribution of study participants awareness regarding dry eye by their bio-demographic data

Factors	Overall knowledge level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					
< 20	36	100.0%	0	0.0%	.154
21-30	200	84.4%	37	15.6%	
31-40	88	95.7%	4	4.3%	
41-50	83	97.6%	2	2.4%	
> 50	44	100.0%	0	0.0%	
Gender					
Male	172	91.5%	16	8.5%	.905
Female	279	91.2%	27	8.8%	
Education					
Below secondary	28	100.0%	0	0.0%	.004*
Secondary	83	98.8%	1	1.2%	
University	340	89.0%	42	.0%	
Work					
Unemployed	88	95.7%	4	4.3%	.016*
Student	148	86.5%	23	13.5%	
Employed	182	91.9%	16	8.1%	
Retired	33	100.0%	0	0.0%	
Previously heard about eye dryness					
Yes	393	90.3%	42	9.7%	.042*
No	58	98.3%	1	1.7%	
Do you know anyone with dry eyes?					
Family member	180	89.6%	21	10.4%	.120#
Relative	50	94.3%	3	5.7%	
Friend	35	87.5%	5	12.5%	
Others	24	82.8%	5	17.2%	
None	162	94.7%	9	5.3%	
Source of information regarding eye dryness					
Doctor/Healthcare Provider	193	87.3%	28	12.7%	.001*
Internet	128	86.5%	20	13.5%	
Mass media	63	85.1%		14.9%	
Newspapers or magazines	23	88.4%	3	.6%	
Friend / colleague	162	88.5%	21	.5%	
Others	102	87.2%	15	12.8%	
None	42	97.7%	1	2.3%	

P: Pearson X² test
* P < 0.05 (significant)

#: Exact probability test

DISCUSSION

Dry eye is a common tear insufficiency condition that affects millions of people throughout the world. It's an unpleasant issue that's frequently overlooked and misdiagnosed. Dry eye is classified into three stages in clinical terms⁸⁻¹¹. The patient has symptoms but no signs in the first stage; in the second stage, the patient has symptoms as well as reversible signs such as minor corneal erosions and superficial ulcers, mucous discharge, and nasal and temporal bulbar conjunctival hyperemia. Patients in the third stage have symptoms and signs similar to those in the first and second stages, as well as irreversible indicators including corneal opacity and ulceration, which can lead to sight-threatening corneal problems. The findings of our study is match able with one US base study stated that Patients with dry eye frequently report difficulty with reading. However, the impact of dry eye on reading has not been studied in detail. This study shows the unfavorable effect of dry eye on reading speed and offers mechanisms that may be responsible. A sufficient amount of people in our sample smoke cigarettes or shisha, according to the findings. Various studies have implicated smoking, air pollution, and other risk factors. By acting as a direct irritant on the eye, smoking predisposes the eye to tear film instability and is one of the modifiable risk factors for dry eye^{4,5}.

Our findings revealed that everyone in our study population had dry eye condition. It also reveals that the majority of Saudi adults watch TV or use a mobile phone, computer, or other smart device for significant amounts of time on a regular or practically daily basis.

CONCLUSION

To conclude, dry eye syndrome affects the majority of people and is primarily caused by their regular activities. In order to provide greater prospects for improved medical management and awareness workshops and campaigns required to raise awareness about dry eye, recent knowledge about causes, symptoms, and diagnostic tests is essential.

Authorship Contribution: All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article

and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

Potential Conflict of Interest: None

Competing Interest: None

Acceptance Date: 16 December 2021

REFERENCES

1. Liu NN, Liu L, Li J, et al. Prevalence of and Risk Factors for Dry Eye Symptom in Mainland China: A Systematic Review and Meta-Analysis. *J Ophthalmol* 2014;748654.
2. Kalakattawi RM, Al Rubaie SS, Alsiaqi RM, et al. Knowledge and Practice Regarding Dry Eye among General Population in Western Region of Saudi Arabia. *J Basic Clin Pharma* 2018;9:68-72.
3. Shanti Y, Shehada R, Bakkar MM, et al. Prevalence and associated risk factors of dry eye disease in 16 northern West bank towns in Palestine: a cross-sectional study. *BMC Ophthalmol* 2020;20(1):26.
4. Moss SE, Klein R, Klein BE. Prevalence of and risk factors for dry eye syndrome. *Arch Ophthalmol* 2000;8(9):1264-8.
5. Patel VD, Watanabe JH, Strauss JA, et al. Work productivity loss in patients with dry eye disease: an online survey. *Cur Med Res Opi* 2011;27(5):1041-8.
6. Pflugfelder SC. Prevalence, burden, and pharmacoeconomics of dry eye disease. *The Am J Man Care* 2008;14(3):102-6.
7. Smith JA. The Epidemiology of dry Eye disease: report of the Epidemiology subcommittee of the international dry Eye workshop. *Ocu Sur* 2007;5(2):93-107.
8. Apostol S, Filip M, Dagne C, et al. Dry eye syndrome: Etiological and Therapeutic aspects. *Optalmol* 2003;59(4):28-31.
9. Brown MM, Brown GC. Utility assessment and dry eye disease. *Ophthalmol* 2004;4:852-3.
10. Pflugfelder SC. Management and Therapy of dry eye disease: Report of the Management and Therapy subcommittee of the international dry eye workshop. *Ocu Sur* 2007;5(2):163-78.
11. Swanson M. Compliance with and Typical usage of Artificial Tears in Dry eye Conditions. *Am Opt Assoc J* 1998;10:649-55.