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KNOWLEDGE OF SYMPTOMS , RISK FACTORS AND IMPACT ON THE QUALITY OF LIFE OF DRY EYE SYNDROME AMONG SAUDI POPULATION

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Abstract

Background and aim: *Dry eye syndrome is one of the common ocular conditions for which patient seek ophthalmic care. The aim of this study was to assess the level of awareness and knowledge of DES symptoms, risk factors and its impact on the quality of life among the general population of Al-Hasa region of Saudi Arabia.*

Methods: *A cross-sectional sampling used to collect the data. The data were collected from 412 participants who met the inclusion criteria. Relevant information obtained from both genders males and females by using a standardized paper and electronic questionnaire. The collected data analyzed by using SPSS version 23. In the statistical analysis, Descriptive statistics, frequencies, and percentages were used to describe all variables. Results: A total of 412 participants who met the inclusion criteria, 282 (68.4%) were female and 130 (31.6%) were male and aged either between 31 and 40 years 114 (27.7%) or between 41 and 50 years 107 (26.0%). More than half 257 (62.4) had a bachelor's degree. The majority 224 (58.7%) had not heard about DES before. According to the quality of life, most of them correctly think that dry eye syndrome affects the patients physically, emotionally and psychologically in addition to the social life of the patients.*

Conclusion: *In conclusion, most of the participants have a moderate knowledge of dry eye. A planned educational program is needed; the educational level of the population needs to be taken into consideration when the program is planned.*

Keywords: *Dry eye syndrome, DES, KFU, Al-Hasa, Saudi Arabia*

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INTRODUCTION:

In 2007, the International Dry Eye Work Shop defined dry eye disease as, "a multifactorial disease of the tears and ocular surface that result in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface".Dry eye syndrome also is known as (keratoconjunctivitis sicca (KCS), keratitis sicca, sicca syndrome, xerophthalmia, dry eye disease (DED), ocular surface disease (OSD) and dysfunctional tear syndrome) is one of the most common ocular conditions for which patients seek ophthalmic care.(1) According to several studies that have been conducted around the world, the prevalence of dry eye syndrome was estimated to be within the range of 7.4%–33.7% . The prevalence increases with age and is very common among middle aged and elderly people, due to systemic drug effects , contact lens usage , refractive surgeries and autoimmune diseases which are highly prevalent in these age groups . (2–4) Furthermore , some researches shows that DES is more common in females than in males and this was attributed to be due to hormonal changes. (5)Other researches shows that DES is also prevalent in patient with Pylori , computer users and contact lens wearers for a long time. (6,7) However , there is a variation among these previous studies depending on different factors such as definition of the disease , tools of the diagnosis and population that have been investigated. (8–10) Dry eye syndrome is classified by Lemp in 1995, into two main types aqueous deficient dry eye and evaporative dry eye. The Aqueous deficiency is further classified into Sjögren syndrome and non-Sjögren syndrome. While , the evaporative dry eye is classified into intrinsic and extrinsic factors. (11–13) The Aqueous deficient dry eye is due to lack or inappropriate production of tears by the tear glands and this type of dry eye is usually found in older patients, postmenopausal women and autoimmune diseases such as Sjögren syndrome and rheumatoid arthritis. (4,14) Patients with Sjögren syndrome present with manifestations of dry eye (xerophthalmia) and dry mouth (xerostomia) because of autoimmune infiltration of both lacrimal glands and salivary glands which subsequently lead to loss of their normal function.(15) While , patients with non-Sjögren syndrome are usually associated with lacrimal gland dysfunction due to vitamin A deficiency , trachoma ,lymphoma and sarcoidosis. (16)

In case of evaporative dry eye, the eyes dry out because of increased tear evaporation as in case of eyelids abnormalities or decrease blinking. Multiple researches reported that , some environmental factors and daily habits play a role in evaporative dry eye such as dry climate , wind , chemical burns , air pollution , driving , smoking , contact lens usage , watching TV and computer. (17) Patients with dry eye commonly present with ocular burning, foreign body sensation, stinging sensation , ocular pain and redness , photophobia , blurred vision , excess tearing and itching.(18,19) Dry eye on the other hand, may be a manifestation of systemic diseases such as RA, SLE, hyperthyroidism, in which early detection and diagnosis is essential to prevent life threatening complications. Because, the history and presentation of dry eye varies among different patients, a correlation between subjective and objective evaluation are required to establish the diagnosis. Therefore, a number of a validated questionnaires have been developed not only to establish the diagnosis ,but also , to assess the severity and evaluate the efficacy of the treatment. (20)There are a multiple diagnostic tests that have been used to diagnose DES including tear film breakup time (TBUT), epithelial staining, Schirmer test, tear function index, tear osmolarity, impression cytology, fluorophtometry, tear fluid protein immunoassay and tear ferning test. Although , several researches aimed to investigate the effectiveness of these tests , there is no gold standard test in establishing the diagnosis of DES.(21) The treatment options of DES are widely varied. The aim of the treatment are to relieve the symptoms and discomfort , return the normal function of the ocular surface , tear film and prevent further consequences such as corneal damage .(22)

Treatment of DES range from patient education , environmental and dietary modifications , artificial tear , punctal plugs, topical and/or systemic anti-inflammatory medications to surgery. (21) Although the probability of dry eye leading to visual impairment or blindness is low, it has a great impact on the quality of life of the patients socially and psychologically. Additionally , dry eye decreases the vision related quality of life of patients such reading , work productivity , computer related work, watching TV and driving as reported by (Miljanovic and associates, 2007) (23)

Previous studies in Al-Hasa region of Saudi Arabia, focused on the prevalence and risk factors of dry eye syndrome among the patients. While, the other aspects such as the awareness of the disease symptoms, risk factors and impact on the quality of life have not been investigated in detail. According to a study done in Al-Hasa , revealed that Al-Hasa population are at a high risk of developing DES because of environmental factors that mentioned

previously such as hot and dry climate. (24) Therefore, it was aimed to conduct this study to assess the level of awareness and knowledge of DES symptoms, risk factors and its impact on the quality of life among general population of Al-Hasa region of Saudi Arabia.

MATERIAL AND METHODS:

Study design: A cross-sectional quantitative, descriptive and analytic research designed to answer the study questions about the Awareness of symptoms, risk factors and effect on the quality of life of dry eye syndrome among general population in Al-Hasa region of Saudi Arabia.

Study population: The study population was 873326 represented the total population of Al-Hasa region of Saudi Arabia.

Study sample: The study included 384 individuals from general population living in Al-Hasa region of Saudi Arabia.

Study date and time: The study conducted from 1 Sep 2018 to 20 Oct 2018.

Procedure:

The study was conducted from September 2018 to October 2018. The sample size calculation was performed using a website (www.raosoft.com). The margin of error was 5%, the confidence level was 95% and the population size was 873326 which represent the total population of Al-Hasa region of Saudi Arabia, census 2010, taken from the official website of the (General Authority for Statics). According to previous data the recommended sample size was 384.

Relevant information obtained from both genders males and females by using a standardized paper and electronic questionnaires. The questionnaire was prepared in English language and then translated to Arabic language and validated by an expert. The questionnaire consisting of basic Socio-demographic variables (place of resident, gender, age, education level) and 15 questions to assess the awareness of the participants regarding Dry eye syndrome (DES) such as background knowledge, symptoms, risk factors and impact on the quality of life.

Inclusion criteria:

1- All participants from Al-Hasa region.

Exclusion criteria:

1- Participants who are not from Al-Hasa region.

2- Known cases of dry eye syndrome and under treatment.

Ethical clearance:

Ethical clearance obtained from the college ethics committee. Also, an informed consent statement included in the questionnaire. Only those who agree to fill the questionnaire and participate on the study after explanation of the study nature included and their participation is voluntary.

Statistical analysis:

Three-Point Scale (Yes, No, I don't know) was utilized to evaluate Knowledge level of Al- Hasa population regarding DES. A final score was created for the knowledge questions as correct answers got a score of "1" whereas wrong answers got a score of "0". Total knowledge score was computed and the median value was identified (it was 6 out of 11). Participant scored below the median value were considered as having "inadequate knowledge" whereas those scored at or above the median value were considered as having "adequate knowledge". Data were entered, coded and processed using Microsoft Excel and the software Statistical Package for Social Science (SPSS) (Version 23) for Windows system. Descriptive statistics, frequencies and percentages were used to describe all variables. Association between dependent variables (Knowledge level of Al-Hasa population regarding DES) and independent variables (Participant's socio-demographics) were tested by using Chi-square test. *P* values of <0.05 were considered statistically significant.

RESULTS:

Out of 412 participants who met the inclusion criteria, 282 (68.4%) were female and 130 (31.6%) were male, and aged either between 31 and 40 years 114 (27.7%) or between 41 and 50 years 107 (26.0%). More than half 257 (62.4) had a Bachelor degree. The majority 224 (58.7%) had not heard about DES before. Almost one-quarter of them (25.7%) had their information regarding dry eye syndrome from Social media, followed by Internet (22.8%) and Awareness campaigns (7.5%) (Table 1).

Table 1: Baseline characteristics (N=412).

Variable	Frequency (N)	Percent (%)
Gender		
Male	130	31.6
Female	282	68.4
Age		
Less than 20	35	8.5
20-30	97	23.5
31-40	114	27.7
41-50	107	26.0
More than 50	59	14.3
Educational level		
Less than high school	8	1.9
High school diploma	136	33.0
Bachelor	257	62.4
Master and PhD	11	2.7
Source of information		
Books	15	3.6
Internet	94	22.8
Awareness campaigns	31	7.5
Social media	106	25.7
Other	166	40.3

As illustrated from Figure 1, The main symptoms positively picked of DES were Foreign body sensation (23.17%), Burning sensation (22.54%) and Itching (18.73%)

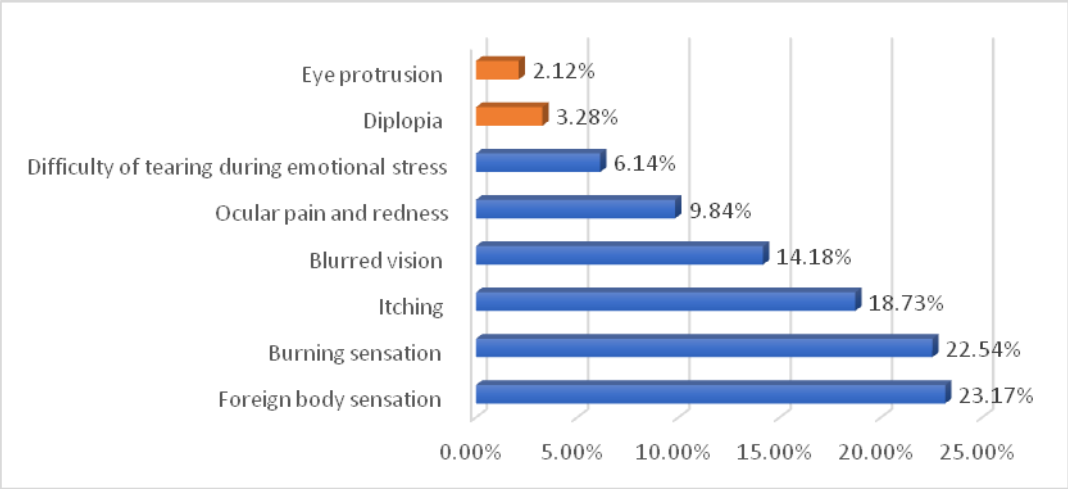

Figure 1: Responses of the participants to DES symptoms question.

Table 2 shows the responses of the participants to knowledge questions about DES risk factors and its effects on the quality of life. As illustrated in this table, most of the participants could recognize that aging, lacrimal gland, contact lens dysfunction and eye inflammations increases the risk of developing dry eye syndrome but less than half of them think that some medications such as (anti-histamine, anti-depressants and oral contraceptive pills) and refractive surgery (LASIK) or other cosmetic eye surgeries increase the risk of dry eye syndrome.

Only 15% of them correctly agreed that there is a relation between autoimmune disorders like (RA,SLE) and DES.

According to the quality of life, most of them correctly think that patients with dry eye syndrome have difficulties in performing their daily activities such as reading, driving and using a computer and affects the patients emotionally and psychologically in addition to the social life of the patients. Moreover, 62.6% of them positively think that DES leads to low level of productivity at the workplace.

Table 2: Responses of the participants to knowledge questions (N=412).

Questions	Positive responses No	%
1. Do you think that aging increases the risk of developing dry eye syndrome (DES)? **(Yes)**	212	51.5
2. Do you think that some medications such as (anti-histamine, anti-depressants and oral contraceptive pills) increase the risk of dry eye syndrome (DES)? **(Yes)**	110	26.7
3. Do you think that there is a relation between eye inflammations and dry eye syndrome (DES)? **(Yes)**	232	56.3
4. Do you think that Lacrimal gland dysfunction increase the risk of developing dry eye syndrome (DES)? **(Yes)**	223	54.1
5. Do you think that refractive surgery (LASIK) or other cosmetic eye surgeries increase the risk of dry eye syndrome (DES)? **(Yes)**	178	43.2
6. Do you think that contact lens wearers are at high risk of developing dry eye syndrome (DES)? **(Yes)**	314	76.2
7. Do you think that there is a relation between autoimmune disorders like (RA,SLE) and dry eye syndrome (DES)? **(Yes)**	62	15.0
8. Do you think that patients with dry eye syndrome (DES) have difficulties in performing their daily activities such as reading, driving and using a computer? **(Yes)**	299	72.6
9. Do you think that dry eye syndrome (DES) affects the patients emotionally and psychologically? **(Yes)**	206	50.0
10. Do you think that dry eye syndrome (DES) leads to low level of productivity at the workplace? **(Yes)**	258	62.6
11. Do you think that dry eye syndrome (DES) affects the social life of the patients? **(Yes)**	217	52.7

More than half of participants (55%) have adequate knowledge regarding DES. (Figure 2).

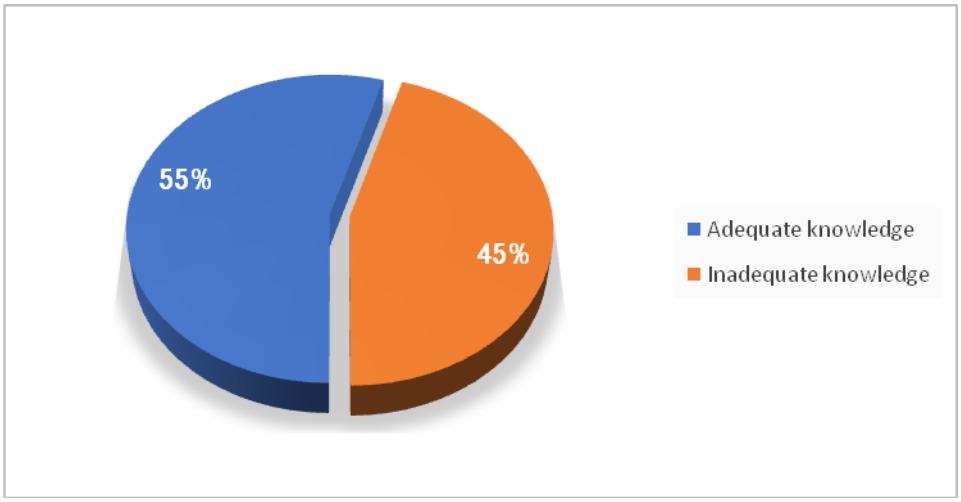

Figure 2: Knowledge level of Al-Hasa population regarding DES.

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From Table 3, it is evident that 81.8% of participants who had Master and PhD degree were more knowledgeable than other participants categories of education p=0.002. (Figure 3). Regarding the source of information, the highest percentage of sufficient knowledge was reported among participants who reported books as the main source of information DES (80.0%)%), followed by Awareness campaigns (64.5%) whereas the lowest percentage was observed among those whose main source of information was social media (53.8%), p=0.043. (Figure 4).

Table 3: Socio-demographics factors associated with knowledge of participants regarding dry eye syndrome (DES).

	Adequate Knowledge N = 225	Inadequate knowledge N= 187	P-value
Gender			
Male	67 (51.5%)	63 (48.5%)	0.395
Female	63 (48.5%)	124 (44.0%)	
Age			
Less than 20	17 (48.6%)	18 (51.4%)	0.271
20-30	61 (62.9%)	36 (37.1%)	
31-40	56 (49.1%)	58 (50.9%)	
41-50	61 (57.0%)	46 (43.0%)	
More than 50	30 (50.8%)	29 (49.2%)	
Educational level			
Less than high school	1 (12.5%)	7 (87.5%)	0.002 *
High school diploma	63 (46.3%)	73 (53.7%)	
Bachelor	152 (59.1%)	105 (40.9%)	
Master and PhD	9 (81.8%)	2 (18.2%)	
Source of information			
Books	12 (80.0%)	3 (20.0%)	0.043 *
Internet	57 (60.6%)	37 (39.4%)	
Awareness campaigns	20 (64.5%)	11 (35.5%)	
Social media	57 (53.8%)	49 (46.2%)	
Other	79 (47.6%)	87 (52.4%)	

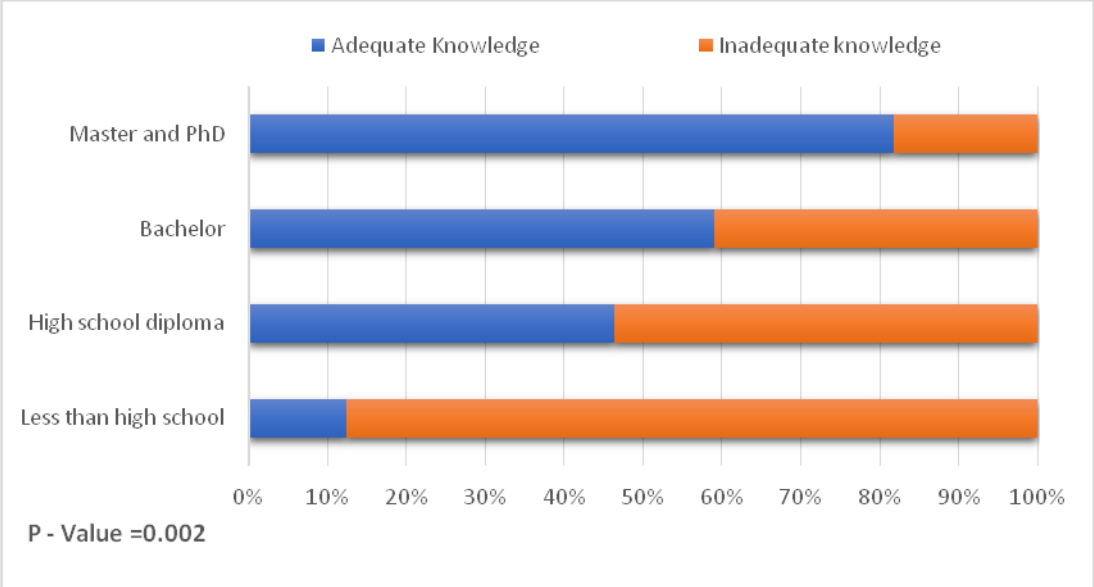

Figure 3: The significant relation between knowledge and educational levels.

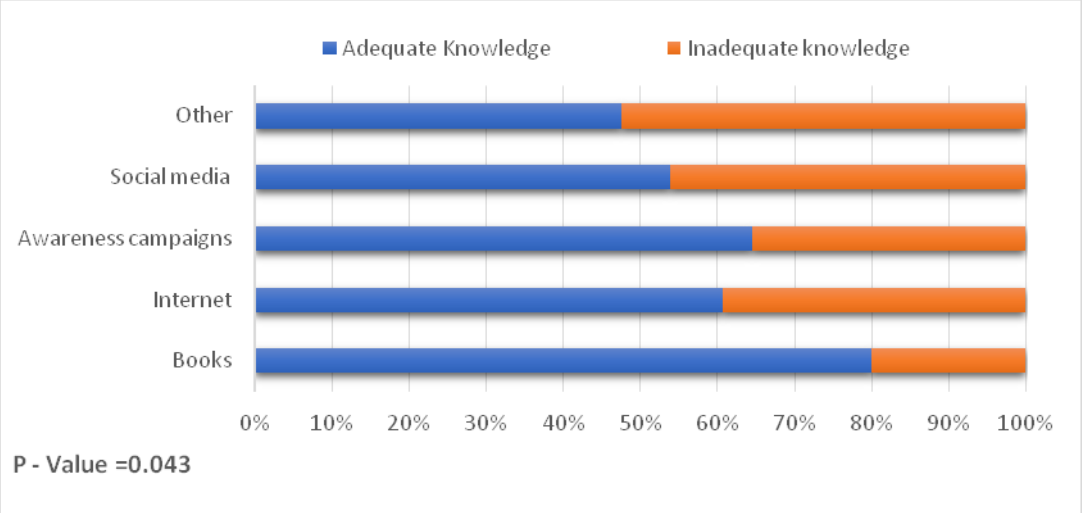

Figure 4: The significant relation between DES knowledge and source of information.

DISCUSSION:

Limited public understanding of Dry eye syndrome can affect many aspects such as its role in the quality of life. Thus, through this study we aimed to determine the knowledge of Al-Hasa population about dry eye syndrome (DES).

According to baseline characteristics, the number of women participating has doubled the men, which means female had better cooperation. In our study, the percentage of knowledge was equivalent to 55%, which indicates that the population has a moderate to a high knowledge about DES. The high prevalence rate of dry eye syndrome may explain the high level of awareness about the disease among Al-Hasa population. Peking University in China aimed to assess the awareness of dry eye syndrome in the population visiting general eye clinics. The study concluded that, the awareness level of dry eye syndrome was low among the population in the general eye clinics.(25) Also, poor awareness of dry eye syndrome was reported by the patients attending ophthalmic clinic in Birmingham in comparison with the other ocular conditions such as glaucoma and cataract which showed high level of awareness.(26)

There was another study conducted in Jordan, which aimed to assess the public awareness of common eye diseases including dry eye syndrome. They found that 51.9% of the study population knew about dry eye syndrome and their main source of information was

family, friends and relatives followed by media, internet, books, ophthalmology clinic, previous history and optometry clinics.(27) The awareness level of the population in the previous studies were low compared to the awareness of Al-Hasa population and this could be attributed to the high prevalence of dry eye syndrome among Al-Hasa population as reported in the recent study. (24)

In our study, the main source of information was books followed by awareness campaigns, internet and social media. The knowledge of Al-Hasa population towards DES was significantly higher among those who got their information from books, which indicates the important role played by books in alerting population regarding DES in our community. However, a significant number of Saudi and Jordanian people use social media as a main source of health-related information.

This finding shows that the internet plays a key role in raising awareness of DES and suggests a great responsibility of the ministry of media and medical staff in educating population toward better health care practices. In our study, we found that about 51.5% subjects were aware that ageing increases the risk of developing dry eye syndrome. Only 22.9% of the Jordanian population were aware that ageing is one of the risk factors of the dry eye syndrome which indicates poor awareness.(49) S.C.Tiwari conducted a study to assess the awareness of the health problems of elderly including dry eye syndrome as it is associated with ageing and reported poor awareness, in which 95.86% of the population were unaware about the association between ageing and dry eye syndrome. (28)

In our study, 26.7% of the participants were aware that some medications such as anti- histamine, anti-depressants and oral contraceptive pills increase the risk of dry eye syndrome. On the other hand , there was better awareness of Jordanian population about the risk of medications leading to dry eye in which 28.2% of the participants reported that there is an association between some medications and developing dry eye syndrome (DES).(27) We found that 15% of Al-Hasa population were aware about the systemic diseases that may increase the risk of dry eye syndrome such as Rheumatoid arthritis (RA) and Systemic lupus erythematosus (SLE). On the other hand, Jordanian population had better awareness in which 18.8% of the participants were aware about the risk of systemic diseases in causing dry eye syndrome.(27) Additionally, we found those who had Master and PhD degrees have more knowledge than other participants (P-value=0.002), this could be justified by nature of their degree and availability of information. Similar result were reported for Jordanian population in which a high level of education was significantly associated with a high level of awareness of dry eye syndrome.(27)

Regarding the effects of dry eye syndrome (DES) on the quality of life of the patients, there was a study done in United States, which showed that 690 of the participants reported that symptomatic dry eye was significantly associated with difficulties in performing the daily activities such as reading, driving, watching TV, using a computer and carrying out a professional work.(23) In the present study, we had similar findings in which 72.6% of the participants agree about the fact that dry eye syndrome (DES) affects the daily activities of the patients such as reading , driving and using a computer. About 62.6% of the participants thought that dry eye syndrome (DES) affects the productivity of the patients at the workplace. However, only 50% of the participant thought that dry eye syndrome (DES) affects the patient emotionally and psychologically. And 52.7% thought that dry eye syndrome (DES) affects the social life of the patients. Surprisingly, in our study we found that males had better awareness than females about dry eye syndrome. Unlike, the Jordanian population in which females appeared to be more aware than males about dry eye syndrome and this could be attributed to the high prevalence of dry eye among females. (27)

In our study, we found that older population were more aware about dry eye syndrome and its risk factors compared to the younger population. This could be explained by the fact that dry eye syndrome is commonly seen with ageing, also elderly people would probably have more health-related information. Opposite findings were reported in Jordan , they found that younger population had better awareness than older population about dry eye syndrome. (27)

There are two studies conducted in Saudi Arabia regarding DES, and both aimed to assess the prevalence of dry eye syndrome (DES) in a different regions of Saudi Arabia such as eastern and western regions. On the other hand , the community knowledge and the level of awareness of DES symptoms , risk factors and impact on the quality of life were not been investigated. (24)(29) Therefore , we cannot compare the results of these studies with the results of our study.

STRENGTHS OF THE STUDY:

The study used Al-Hasa population, who are at a high risk of developing DES because of environmental factors that mentioned previously such as hot and dry climate. (24)

The questionnaires were self-administered allowing the respondents to answer the questions independently. Furthermore, each one in population has an equal chance of being chosen to participate which decrease the bias and large sample size had supported the power of the results.

LIMITATIONS OF THE STUDY:

This study has some limitations, it was conducted in only one city in Saudi Arabia; therefore, the obtained results cannot be generalized to the population in all the country. Future researches on the topic need recruitment of population from different areas in the country. The questionnaire was self-administered making it possible for a biased reporting by the practitioners. Most of the data collected relied on the population memory which may also lead to reporting bias.

CONCLUSIONS AND RECOMMENDATION:

In conclusion, most of the participants have a moderate to high knowledge about dry eye. The high prevalence rate of dry eye syndrome may explain the high level of awareness about the disease in Al-Hasa population. A planned educational program is needed; the educational level of the population needs to be taken into consideration when the program is planned.

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REFERENCES:

1. DEWS. The definition and classification of dry eye disease: report of the definition and classification of the Dry Eye WorkShop (2007). The Ocular Surface. 2007.
2. Moss SE, Klein R, Klein BE. Prevalence of and risk factors for dry eye syndrome. Arch Ophthalmol. 2000;
3. Pflugfelder SC. Prevalence, burden, and pharmacoeconomics of dry eye disease. American Journal of Managed Care. 2008.
4. Schein OD, Munuz B, Tielsch JM, Bandeen-Roche K, West S. Prevalence of dry eye among the elderly. Am J Ophthalmol. 1997;
5. Schaumberg D a, Buring JE, Sullivan D a, Dana MR. Hormone replacement therapy and dry eye syndrome. JAMA. 2001;
6. Saccà SC, Pascotto A, Venturino GM, Prigione G, Mastromarino A, Baldi F, et al. Prevalence and treatment of Helicobacter pylori in patients with blepharitis. Invest Ophthalmol Vis Sci. 2006;
7. Gowrisankaran S, Sheedy JE. Computer vision syndrome: A review. Work. 2015.
8. Lin PY, Tsai SY, Cheng CY, Liu JH, Chou P, Hsu WM. Prevalence of dry eye among an elderly Chinese population in Taiwan: The Shihpai eye study. Ophthalmology. 2003;
9. Lee AJ, Lee J, Saw S-M, Gazzard G, Koh D, Widjaja D, et al. Prevalence and risk factors associated with dry eye symptoms: a population based study in Indonesia [Internet]. Vol. 86, Br J Ophthalmol. 2002. Available from: www.bjophthalmol.comhttp://bjo.bmj.com/
10. McCarty CA, Bansal AK, Livingston PM, Stanislavsky YL, Taylor HR. The epidemiology of dry eye in Melbourne, Australia. Ophthalmology. 1998;
11. Lemp M. Report of the National Eye Institute/Industry Workshop on Cl... : Eye & Contact Lens. contact lens Sci Clin Pract. 1995;
12. Fraunfelder FT, Sciubba JJ, Mathers WD. The role of medications in causing dry eye. Journal of Ophthalmology. 2012.
13. Craig JP, Nichols KK, Akpek EK, Caffery B, Dua HS, Joo CK, et al. TFOS DEWS II Definition and Classification Report. Ocular Surface. 2017.
14. Fujita M, Igarashi T, Kurai T, Sakane M, Yoshino S, Takahashi H. Correlation between dry eye and rheumatoid arthritis activity. Am J Ophthalmol. 2005;
15. Driver PJ, Lemp MA. Meibomian gland dysfunction. Survey of Ophthalmology. 1996.
16. Guzey M, Ozardali I, Basar E, Aslan G, Satici A, Karadede S. A survey of trachoma: The histopathology and the mechanism of progressive cicatrization of eyelid tissues. Ophthalmologica. 2000;
17. Versura P, Nanni P, Bavelloni A, Blalock WL, Piazzi M, Roda A, et al. Tear proteomics in evaporative dry eye disease. Eye. 2010;
18. Ohashi Y, Ishida R, Kojima T, Goto E, Matsumoto Y, Watanabe K, et al. Abnormal protein profiles in tears with dry eye syndrome.

Am J Ophthalmol. 2003;
19. Jones DT, Monroy D, Ji Z, Atherton SS, Pflugfelder SC. Sjogren's syndrome: Cytokine and Epstein-Barr viral gene expression within the conjunctival epithelium. Investig Ophthalmol Vis Sci. 1994;
20. McGinnigle S, Naroo SA, Eperjesi F. Evaluation of Dry Eye. Survey of Ophthalmology. 2012.
21. Behrens A, Doyle JJ, Stern L, Chuck RS, McDonnell PJ, Azar DT, et al. Dysfunctional tear syndrome: A Delphi approach to treatment recommendations. Cornea. 2006;
22. DEWS. International Dry Eye Workshop. Methodologies to diagnose and monitor dry eye disease. Ocul Surf. 2007;
23. Miljanović B, Dana R, Sullivan DA, Schaumberg DA. Impact of Dry Eye Syndrome on Vision-Related Quality of Life. Am J Ophthalmol. 2007;
24. Alshamrani A, Almousa A, Almulhim A, Alafaleq A, Alosaimi M, Alqahtani A, et al. Prevalence and risk factors of dry eye symptoms in a Saudi Arabian population. Middle East Afr J Ophthalmol. 2017;
25. Qiu W, Liu Z, Ji J, Zeng L, Li X, Wang W. [Randomly sampling survey of dry eye awareness in general eye clinic]. Zhonghua Yan Ke Za Zhi. 2013;
26. Sudesh S, Downes SM, McDonnell PJ. Audit of patients' awareness of ophthalmic diagnoses. Qual Heal Care. 1993;
27. Haddad MF, Bakkar MM, Abdo N. Public awareness of common eye diseases in Jordan. BMC Ophthalmol. 2017;
28. Tiwari SC, Trichal M, Mehrotra B, Najeeb S. A Study of Awareness of Health Problems of the Elderly with Reference to Mental Health Results : 2009;12(2):263–8.
29. Kalakattawi RM, Saed S, Rubaie A, Alslaqi RM, Al-shehri LA, Alzahrani A. Knowledge and Practice Regarding Dry Eye among General Popu- lation in Western Region of Saudi Arabia. 2018;68–72.