THE RELATIONSHIP BETWEEN SYMPTOMATIC DRY EYE AND OCCUPATION

Submitted: 11 January, 2022
Accepted: 22 January, 2023

Shiza Mushtaq[1]
Rashida Riaz[2]

For Authors' affiliation & contribution see end of Article

Corresponding Author:
Shiza Mushtaq
Trainee Optometrist
College of Ophthalmology & Allied Vision Sciences, Lahore. (COAVS)
shizamushtaqq@gmail.com

ABSTRACT

OBJECTIVE: *To check the relationship between symptomatic dry eye disease and different occupations. Environmental factors play an important etiological role in dry eye.*

METHOD: *A cross-sectional survey was done on 174 subjects presenting in Mayo Hospital Eye Outdoor department with the help of a self-designed, pre-tested questionnaire based on the symptoms of dry eye disease. Questionnaire was used to assess the relationship between occupation and dry eye disease. The study included participants of both genders of different age groups. Verbal consent was taken by every respondent before being interviewed. SPSS 21 software was used for data analysis.*

RESULTS: *Use of VDTs, sedentary occupations with indoor working environments with air conditioners, occupations demanding prolonged use of computers, working in the presence of germs, toxins, chemicals and climatic factors that effects the eye in the adverse manner were found to be at highest risk of dry eye disease. While occupations which involved more physical movement, social working, less digital working and government employees showed lowest risk of DED. Subjects with occupations like accounting, graphic designing, managers etc. showed highest prevalence of symptomatic dry eye disease. And medical representatives, office boys, government employees showed lowest prevalence of dry eye disease.*

CONCLUSION: *It was found that the people who had indoor occupations showed high prevalence of symptomatic dry eye disease and people who had outdoor and physically active occupations were at a lower risk of developing dry eye disease.*

KEYWORDS: *Symptomatic dry eye disease, VDTs, occupation, indoor and outdoor occupations.*

INTRODUCTION

The Dry Eye is a disease of diverse etiology affecting the tears forming system as well as the ocular surface and its drainage system. It is characterized by ocular discomfort, disturbance in vision, and that of the tear film. The latter may result in damage to the corneal surface (ulceration and scarring).[1] The symptoms and the consequences of the dryness may result in deteriorating health-related quality of life (HRQL)[2] and vision-related quality of life.[3] Dry eye is also known as non-Sjögren's keratoconjunctivitis sicca (non-SS KCS). It may be due to reduced production or increased evaporation of tears following a dysfunction of the lacrimal and/or meibomian gland. Sjögren's Syndrome (SS), is an autoimmune disorder involving the whole body characterized by inflammation of the lacrimal and salivary glands, that eventually leads to insufficient tear production, and the typical clinical features of dry eyes and dry mouth. There are two main varieties of Sjogren's Syndrome; primary SS when it is not associated with any other illness, and, secondary type that accompanies any other autoimmune disease like rheumatoid arthritis, Systemic Lupus erythematosus or psoriasis.[4]

Dry eye disease is a multifactorial condition that affects a large number of people. This has a significant impact on one's quality of life and work productivity. Depending on the criterion employed and the group studied, population-based studies reveal a prevalence of symptomatic dry eye ranging from 6 to 52 percent.[5] According to a study, both hereditary and environmental variables play a role in dry eye illness,

with environmental factors accounting for up to 70% of the diversity in dry eye symptoms in the population.[6] Air pollution, the use of visual display terminals (VDTs), low humidity, and air conditioning have all been associated to dry eye illness in various studies.[7]

According to these finding occupation has a lead role in dry eye disease. Different occupations show different prevalence rate of dry eye disease. Studies have shown that occupation is a major factor to dry eye symptomology. Indoor occupations and VDT users have a higher prevalence of dry eye. In the present situation of Covid-19 most of the physical work has been shifted to work from home. This has increased the screen time of workers and hence increased the prevalence of dry eye disease in workers. Similarly, due to Covid-19 physical classes in schools, colleges and universities has also been shifted to online classes due to which dry eye disease has become prevalent in teaching staff.[8]

Dry eye disease is diagnosed by irritation and discomfort in the eyes. Dry eyes, a foreign body sensation, or a burning sensation in the eyes, along with excessive crying and light sensitivity (photophobia) are all frequent dry eye disease symptoms. In severe cases, irritation may persist or a damage to the eye surface may result.[9] Its diagnosis is primarily based on subjective patient-reported symptoms, hence all cases involving subjectively felt symptoms without an objective clinical analysis are reported.[10]

A study was conducted in which major occupational groups were assessed with dry eye disease. Participants were assessed for their occupation, current working hours, and dry eye symptoms. The results showed that the clerical workers and professionals were at the highest risk of dry eye syndrome.[11] These vocations are typically desk-bound and sedentary and are associated with a high use of visual display terminals (VDTs). Several studies have linked regular use of VDTs to an increased prevalence of eyestrain and DES. Their use has been linked to less spontaneous blinking and, as a result, tear film break-up.[12]

Moreover, other environmental conditions such as high room temperatures and low humidity, as well as the comparatively high presence of air conditioning in these occupations' work environments, may lead to increased tear film break-up and symptomatic dry eye.[7] The biggest risk of symptomatic dry eye is among craft workers, notably construction workers and metal and machinery workers. This isn't surprising, given how closely these jobs are linked with several dangers and health problems, including a higher probability of death.[13] Outdoor occupations were found to be highly protective against dry eye in a study. Skilled agriculture, forestry, and fishing workers, in particular, had a very low incidence of dry eye.[14]

This study was undertaken to explain the relationship of occupation with symptomatic dry eye disease, to show how a particular occupation causes symptoms of dry eye and which occupation was at high risk of developing the disease.

MATERIAL AND METHOD

A cross-sectional survey was done on 174 subjects of mayo hospital eye outdoor with the help of a self-designed questionnaire based on the symptoms of dry eye disease. Questionnaire was used to assess the relationship between occupation and dry eye disease. The study included participants of both genders of different age groups. Verbal consent was taken by every respondent before being interviewed. The research protocol was approved by the Ethical Review Board of College of Ophthalmology and Allied Vision Sciences. The study methods adhered to the tenets of the Declaration of Helsinki for the use of participants in biomedical research.

RESULTS

According to the results a clear association exists between occupation and symptomatic dry eye disease. There is a low risk of symptomatic dry eye disease in outdoor and active occupations. The highest prevalence of symptomatic dry eye was found in sedentary employment and jobs connected with the usage of VDTs. Occupations involved in more computer work showed the highest prevalence of symptomatic dry eye disease due to the negative effects of computer on eye health. Prolonged use of computers causes dryness and burden on eyes. While outdoor occupations like farmer, landlord and all those who work in natural environment are less exposed to symptomatic dry eye disease.Some of the outdoor occupations also showed symptoms of dry eyes due to the environmental factors that effects the eyes adversely.Occupations like farming showed lowest risk of dry eye disease as this is an outdoor and active occupation.Similarly, landlords and machine

operators. Half of the shop keepers showed many symptoms of dry eyes with the response of sometimes.Security guards showed low prevalence of dry eye disease. Medical representatives included in the study showed no risk of dry eye disease. Occupations like painter, businessman, government worker, nurse, office boy, pharmacist, marketing, cobbler, supervisor, tailors were at lowest risk of dry eye disease.

Table -1: Responses of major occupational groups to dry eye symptoms.

		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Do you feel head ache?	Yes	0	0	0	0	0	0	0	2	0	2
	Often	0	0	0	0	2	0	0	0	0	2
	Sometimes	2	2	2	0	0	0	2	0	0	8
	No	8	6	4	2	0	14	0	4	2	40
Total		10	8	6	2	2	14	2	6	2	52
		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Do you feel eye pain?	Yes	0	0	0	0	0	0	0	4	0	4
	Sometimes	4	0	0	0	2	0	2	2	0	10
	No	6	8	6	2	0	14	0	0	2	38
Total		10	8	6	2	2	14	2	6	2	52
		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Do you feel heavy eyelids?	Yes	0	4	0	0	0	0	0	0	0	4
	Sometimes	4	0	0	0	0	0		0	2	6
	No	6	4	6	2	2	14	2	6	0	42
Total		10	8	6	2	2	14	2	6	2	52
		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Do you feel head ache?	Yes	0	0	0	0	2	2	0	0	0	4
	Often	0	0	0	0	0	0	2	0	0	2
	Sometimes	0	4	2	0	0	0	0	0	0	6
	No	10	4	4	2	0	12	0	6	2	40
Total		10	8	6	2	2	14	2	6	2	52
		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Is there watering from your eyes?	Often	0	2	0	0	0	0	0	0	2	4
	Sometimes	0	4	0	0	0	2	2	3	0	11
	No	10	2	6	2	2	12	0	3	0	37
Total		10	8	6	2	2	14	2	6	2	52

Table -1.1:

		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Do you feel burning sensation in your eyes?	Yes	0	2	0	0	2	0	0	0	0	4
	Sometimes	2	0	0	0	0	0	0	0	2	4
	No	8	6	6	2	0	14	2	6	0	44
Total		10	8	6	2	2	14	2	6	2	52
		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Do you feel dryness in your eyes?	Yes	0	0	0	0	2	2	0	0	0	4
	Often	0	0	0	0	0	0	2	0	0	4
	Sometimes	0	0	0	0	0	0	0	2	0	44
	No	10	8	6	2	0	12	0	4	2	52
Total		10	8	6	2	2	14	2	6	2	52

		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Do you feel increased sensitivity to light in your eyes?	Yes	0	2	0	0	0	2	0	0	0	4
	Often	2	0	0	0	0	0	2	0	0	4
	Sometimes	0	0	0	0	0	0	0	2	0	2
	No	8	6	6	2	2	12	0	4	2	42
Total		10	8	6	2	2	14	2	6	2	52
		Occupation									Total
		Account-ant	Manager	Graphic designer	Medical rap	Office boy	Governm-ent worker	Farmer	Shop keeper	Health profess-ional	
Are your eyes ever itchy?	No	4	4	0	0	2	2	2	0	0	4
	Sometimes	6	4	6	2	0	12	0	6	2	4
Total		10	8	6	2	2	14	2	6	2	52

DISCUSSION

The study demonstrates the impact of different occupations in causing dry eye disease in a person. The analysis confirms the relationship of occupation and symptomatic dry eye disease. The data shows the symptoms of dry eye in participants of different occupations. How a certain occupation impact eye health of a person. The working environment of every occupation have a significant impact on persons eyes. Some occupations demand indoor working and some demand active and outdoor working. Both the circumstances have different impact on eyes and risk of symptomatic dry eye disease. In outdoor jobs the risk of dry eye disease is less while in indoor jobs the risk is high. Physically active occupations show low prevalence of dry eye disease.

The majority of desk-bound, sedentary jobs are characterized by a significant use of visual display terminals (VDTs). In various studies, regular use of VDTs has been linked to an increased prevalence of eye fatigue and dry eyes.[7] Their use has been linked to less spontaneous blinking and, as a result, tear film break-up. Furthermore, the comparatively high prevalence of air conditioners in these occupations' work settings may lead to high tear film break-up and severe dry eye. Other climatic factors like high room temperatures and low moisture also have a role in symptomatic dry eye disease.

Occupations like farming showed lowest risk of dry eye disease as this is an outdoor and active occupation. It does not involve many hazardous factors that might cause dry eye. Similarly, landlords were also at a lower risk. Machine operators were also at a low risk because they didn't have any hectic work routine or any eye straining factor in their job. Half of the shop keepers showed many symptoms of dry eyes with the response

of sometimes. This study does not define the reason why shop keepers were at risk of developing symptomatic dry eye disease. This could be a limitation and need more research in particularly this occupation.

Security guards showed low prevalence of dry eye disease as it is an outdoor occupation with no use of visual display terminals. All the security guards included in the study were aged but had a healthy eye status with very less symptoms of dry eyes. Medical representatives included in the study showed no risk of dry eye disease as this is an active occupation and include a lot of physical and social work. Accountants showed highest risk of dry eye disease. Accounting is an indoor occupation with a lot of digital work. It causes digital eye strain and reported highest symptoms of dry eye disease like headache, eye pain, watering, redness, burning sensation, dryness, increased sensitivity to light, foreign body sensation and blurring of vision. It is a visual demanding occupation like graphic designing, including long hours of screen working with focus and very less time for relaxation making it a highly prevalent dry eye disease occupation.

Labourers showed symptoms of dry eyes due to factors like dusk and heat in which they are working. Dust in eyes is also a leading cause of dry eye disease. Occupations like painter, businessman, government worker, nurse, office boy, pharmacist, marketing, cobbler, supervisor, tailors were at lowest risk of dry eye disease as these professions do not include computer work or long duration indoor working. They have a healthy working environment which is less prone to symptomatic dry eye disease.

Health professionals also showed major symptoms of dry eyes as they are indulged in screen use as well as extra use of focusing mechanism of their eyes and most of the people included in this research were optometrists. In an old research[13] it is found that the largest risk of symptomatic dry eye was seen among craft workers, notably building experts and metal and machine workers. This is not very surprising, given that these jobs come with a slew of dangers and health risks, including an elevated risk of death. According to this study, these workers were primarily male (91.1%) and had a significant frequency of dry eye. Welders' eyes are prone to harmful rays, chemicals, toxins and show high symptoms of dry eyes but they use a protective shield before their eyes while working which reduce the risk of dry eye disease to some extent. Ward attendants also showed high risk of dry eye disease because they spend most of their time in hospital environment and are exposed to germs and many other factors responsible for developing dry eye disease.

CONCLUSION

It was found that the people who had indoor occupations showed high prevalence of symptomatic dry eye disease and people who had outdoor and physically active occupations were at a lower risk of developing dry eye disease.

RECOMMENDATION

It is recommended that a relationship exist between symptomatic dry eye and occupation. This study can be improved by doing research on the occupations that were not studied in this research.

Authors' Affiliation & Contribution

[1]Shazia Mushtaq
Trainee Optometrist
College of Ophthalmology & Allied Vision Sciences (COAVS)
shizamushtaqq@gmail.com
Main idea, Literature search, Methodology, Data collection

[2]Dr. Rashida Riaz
FCPS (Ophthalmologist)
Community Ophthalmologist
College of Ophthalmology & Allied Vision Sciences (COAVS)
rashidariaz@gmail.com
Discussion, Data analysis

REFERENCES

1. Lemp MA, Foulks GN. The definition and classification of dry eye disease. Ocul Surf. 2007;5(2):75-92.
2. Friedman NJ. Impact of dry eye disease and treatment on quality of life. Curr Opin Ophthalmol. 2010;21(4):310-6.
3. Miljanović B, Dana R, Sullivan DA, Schaumberg DA. Impact of dry eye syndrome on vision-related quality of life. Am. J. Ophthalmol. 2007;143(3):409-15. e2.

4. Vitali C, Del Papa N. Classification criteria for Sjögren's syndrome. Sjogren's Syndrome. 2016:47-60.

5. Uchino M, Schaumberg DA. Dry eye disease: impact on quality of life and vision. Curr Ophthalmol Rep. 2013;1(2):51-7.

6. Vehof J, Wang B, Kozareva D, Hysi PG, Snieder H, Hammond CJ. The heritability of dry eye disease in a female twin cohort. Investig Ophthalmol Vis Sci 2014;55(11):7278-83.

7. Wolkoff P, Nøjgaard JK, Troiano P, Piccoli B. Eye complaints in the office environment: precorneal tear film integrity influenced by eye blinking efficiency. Occup Environ Med. 2005;62(1):4-12.

8. Akkaya S, Atakan T, Acikalin B, Aksoy S, Ozkurt Y. Effects of long-term computer use on eye dryness. North Clin Istanb. 2018;5(4):319.

9. Begley CG, Caffery B, Chalmers RL, Mitchell GL. Use of the dry eye questionnaire to measure symptoms of ocular irritation in patients with aqueous tear deficient dry eye. Cornea. 2002;21(7):664-70.

10. Lemp A. Report of the National Eye Institute/Industry workshop on clinical trials in dry eyes. Eye Contact Lens. 1995;21(4):221-32.

11. Carter J, Banister E. Musculoskeletal problems in VDT work: a review. Ergonomics. 1994;37(10):1623-48.

12. Tsubota K. Tear dynamics and dry eye. Prog Retin Eye Res. 1998;17(4):565-96.

13. Burkhart G, Schulte PA, Robinson C, Sieber WK, Vossenas P, Ringen K. Job tasks, potential exposures, and health risks of laborers employed in the construction industry. Am J Ind Med. 1993;24(4):413-25.

14. Arndt V, Rothenbacher D, Daniel U, Zschenderlein B, Schuberth S, Brenner H. Construction work and risk of occupational disability: a ten year follow up of 14 474 male workers. Occup Environ Med. 2005;62(8):559-66.