

AN INSIGHT VISION THROUGH DRY EYE SYNDROME: A SURVEY-BASED STUDY

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Article Received on 02/07/2023

Article Revised on 22/07/2023

Article Accepted on 12/08/2023

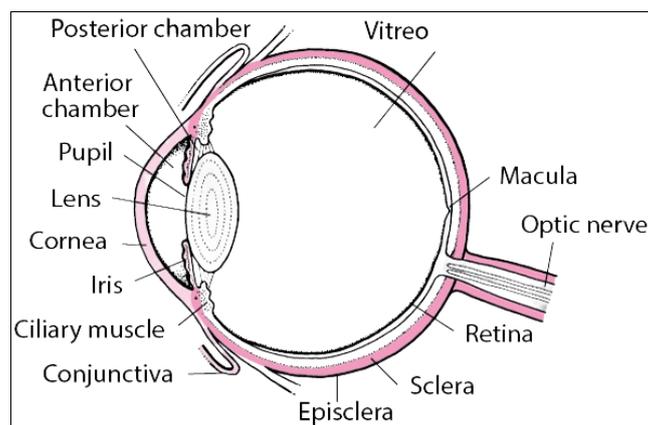
ABSTRACT

Today, dry eye syndrome is a growing public health problem affecting our quality of life and visual functions. It is observed by the loss of homeostasis of the ocular system, which results in various types of symptoms such as tear film instability, ocular hyperosmolarity, and inflammation of the ocular surface. If our innate immune response is unable to cooperate with the body's internal environment, these adverse conditions persist for a long time and this inflammation leads to a chronic form of the disease. Treatment of dry eye syndrome should be aimed at restoring the homeostasis of the ocular surface system. Dry eye syndrome is divided into two types depending on their mechanism, one of which is the reduction of tear film formation and the other is evaporation. Various physiological and environmental factors affect the surface of the eye and disrupt the functions of the ocular system, which may or may not produce symptoms. Therefore, a proper examination of dry eye syndrome is necessary. Various diagnostic tests are available to detect the signs and symptoms of DES. Various case studies also included the determination of exact treatment, duration of treatment, and severity of the disease. The aim of our project is to raise awareness among patients, health professionals, and researchers about the diagnosis and treatment of keratoconjunctivitis sicca (KCS) and the current developments and future challenges in the treatment of dry eye disease.

KEYWORDS: Dry Eye Syndrome, Public health, Tear film instability, Hyperosmolarity in eye, Tear evaporation.**INTRODUCTION**

Dry eye syndrome is a tear film disorder due to reduced tear production or excessive tear evaporation that causes damage to the interpalpebral ocular surface. It is a multifactorial disease of the tear film and ocular surface

that results in symptoms of discomfort, visual disturbances, and tear film instability with potential damage to the ocular surface. It is accompanied by the increased osmolality of the tear film and inflammation of the ocular surface.

**Figure 1. Structure of eye.****Etiology**

Dry eye syndrome is related to different types of causes, which can be divided into primary and secondary. Dry eye can occur secondary to inflammatory diseases (e.g. allergies), hormonal imbalance (e.g. patient under

hormone replacement therapy), and environmental conditions (e.g. dry climate, cigarette smoke). Chronic disorders such as thyroid disease, rheumatoid arthritis, and diabetes mellitus can also lead to dry eye syndrome. In addition to previous eye surgery (such as corneal

transplant, and refractive surgery), long-term use of medications that can cause eye hypersensitivity or toxicity can lead to dry eye syndrome. Various systemic medications such as diuretics, beta-blockers, and antidepressants can also cause dry eye syndrome. As a result of hormonal imbalance, there is a loss of anti-inflammatory protection and a decrease in tear secretion.

Causes

Dry eyes are caused by a variety of reasons that disrupt a healthy tear film. Our tear film has three layers: fatty oils, aqueous fluid, and mucus. This combination normally keeps the surface of our eyes lubricated, smooth, and bright. Problems with any of these layers can cause dry eyes. There are many reasons for tear film dysfunction, including hormonal changes, autoimmune diseases, inflamed eyelid nodes, or allergic eye diseases. In some people, the cause of dry eyes is reduced tear production or increased tear evaporation. If the glands that produce the various elements of our tears are inflamed or don't produce enough water, oil, or mucus, this can lead to dry eye syndrome. When tears lack oil, they evaporate quickly and the eyes cannot maintain a steady supply of moisture.

Treatment

1. Artificial tear drops and ointments

Artificial tears are usually the first step in treating dry eyes. The use of artificial tears is a palliative treatment that helps the symptoms for a few minutes but does not treat the underlying cause of dry eye disease. If you use artificial tears 4 or more times a day, you should use unpreserved artificial tears because the preservatives are likely to make the condition worse.

2. Eye drops to control cornea inflammation topical cyclosporine (Restasis)

These are given twice a day in each eye to treat underlying inflammation in the tear glands so that they produce more and better tears. It usually takes 1 to 4 months for cyclosporine drops to relieve the symptoms and signs of dry eye. These drops have been found to be safe.

3. Permanent punctal occlusion

If the temporary blockage of the tear ducts works well or the blockage is considered important to the health of the eye, silicone plugs can be used. Permanent plugs will keep tears around the eyes if they are in place. They can be removed. Rarely, the plugs may dislodge themselves or move down the tear duct. Many patients find that the plugs improve comfort and reduce the need for artificial tears.

4. Surgery

If necessary, the ducts that drain tears into the nose can be permanently closed to keep more tears around the eye. This is done on an outpatient basis using a local anesthetic. Cyclosporine drops should always be tried at least 6 months before permanent punctal occlusion to

ensure that the patient does not have tears running down the face and glands producing more tears when treating dry eye.

5. Eye drops made from patient's own blood

These are called autologous blood serum drops. They may be an option if the patient has severe dry eye symptoms that do not respond to any other treatment. To make these eye drops, a sample of your blood is processed to remove red blood cells and then mixed with a saline solution.

6. Tear film-oriented therapy

A new treatment strategy developed according to the criteria for the identification and diagnosis of dry eye is discussed in the Dry Eye Workshop (DEWS II) and Aqueous deficient dry eye (ADES) reports. In these newly published reports, it was emphasized that more attention should be paid to etiologic differences. The determination of the necessity of the tear film for a healthy ocular surface and the identification of tear film instability as a key factor in the diagnosis of the dry eye brought attention to the stabilization of the tear film layer, leading to the development of a new strategy called Tear Film-Oriented Therapy. This review highlights the main innovations in dry eye treatment according to the DEWS II and ADES reports. Previously, DED was believed to be largely caused by a lack of tears and was therefore treated with tear substitutes, artificial tears, and tear duct plugs.

7. Nutritional supplements

Doctors sometimes recommend nutritional supplements as part of a holistic dry eye treatment plan. Studies have found that supplements containing omega-3 fatty acids can help dry eyes. Good sources of omega-3s include cold-water fish such as salmon, sardines, herring, and cod. As a vegetarian source of omega-3, some eye doctors recommend flaxseed oil to relieve dry eyes. Also, simply drinking more water can help relieve dry eye symptoms. Mild dehydration often worsens dry eye problems. This is especially true in hot, dry, and windy weather.

Symptoms

- 1) A burning, scratchy or stinging sensation occurs in your eyes.
- 2) Sensitive towards the light.
- 3) Redness of the eye.
- 4) A feeling of having something in your eyes.
- 5) Trouble in wearing contact lenses.
- 6) Difficulty in driving at night.
- 7) Excessive tearing, due to which there is irritation in dry eyes.
- 8) Eye fatigue or blurry vision.

Diagnosis

Several tests are used for the diagnosis of dry eye syndrome to monitor change as follows;

- 1) Tear Break Up Time Test.

- 2) Ocular Surface Dye Staining.
- 3) Schirmer Test.
- 4) Fluorescein Dye Disappearance Test.
- 5) Tear Osmolarity Test.

Lifestyle modifications

- 1) **Location of the computer screen:** Most people find it more comfortable to look at a computer with their eyes looking down. Optimally, the computer screen should be 15 to 20 degrees below eye level (about 4 or 5 inches), measured from the center of the screen, and 20 to 28 inches from the eyes.
- 2) **Reference materials:** These materials should be placed above the keyboard and below the monitor. If this is not possible, a document holder can be used next to the monitor. The goal is to position the documents so that you don't have to move your head when looking from the document to the screen.
- 3) **Lighting:** Position your computer screen to avoid glare, especially from overhead lights or windows. Use blinds or curtains on the windows and replace the light bulbs in the table lamps with lower wattage bulbs.
- 4) **Anti-glare screens:** If there is no way to minimize glare from light sources, consider using an anti-glare filter. These filters reduce the amount of light reflected from the screen.
- 5) **Seating position:** Chairs should be comfortably padded and conform to the body. The height of the chair should be adjusted so that your feet rest flat on the floor. If the chair has armrests, they should be adjusted to provide support for the arms while typing. While typing, the wrist should not rest on the keyboard.

Home remedies

1. Wash your eyelids and lashes.
2. You should take frequent breaks from the computer if you spend many hours in front of it each day.

3. Clean your eyelids and the surrounding area with mild soap or baby shampoo when you wash your face if you have dry eyes.
4. Close your eyes and gently massage the area with the cleaner and you will find that irritation is eased.
5. Eat more fish and fish oil containing omega-3 fatty acids, which may improve the oil film on the eyelids, produced by the meibomian glands, according to the AAO. "Essential fatty acids, such as fish oil, reduce inflammation."
6. Use a warm compress applying a moist, warm compress to your eyes can boost tear production and relieve dry eye symptoms, according to the AAO.
7. Keeping the air clean and moist may prevent dry eye symptoms. The NEI states that a windy, smoky or dry environment may increase tear evaporation and cause dry eye.

METHODOLOGY

Study design & area

The study was based on a cross-sectional survey. The study was carried out across multiple locations and was not limited to certain regions. The questionnaire was prepared in google form and circulated among the population, responses of which were collected and analyzed later. Data of which were assembled and compared with the standard specifications.

Study approval

The study was approved to proceed with survey responses.

Study participants

Data was collected irrespective of gender and age group. The survey focal point was suffering dry eye syndrome post-pandemic.

Data collection

Survey data were collected from 100 subjects. 18 questions were designed to collect the survey responses.

Data analysis

Survey data analysis was done through feedback analysis to get the final results.

Questionnaire

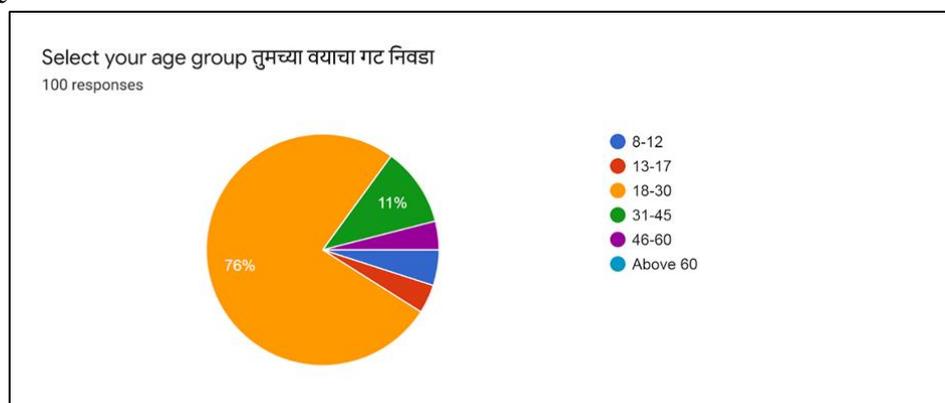


Figure 2.

Interpretation: From the above pie chart, it is observed that 76% responded from the age group between 18-30, 11% responded which age group between 31-45, 06 %

responded from the age group between 8-12, and 04% responded to which age group between 46-60.

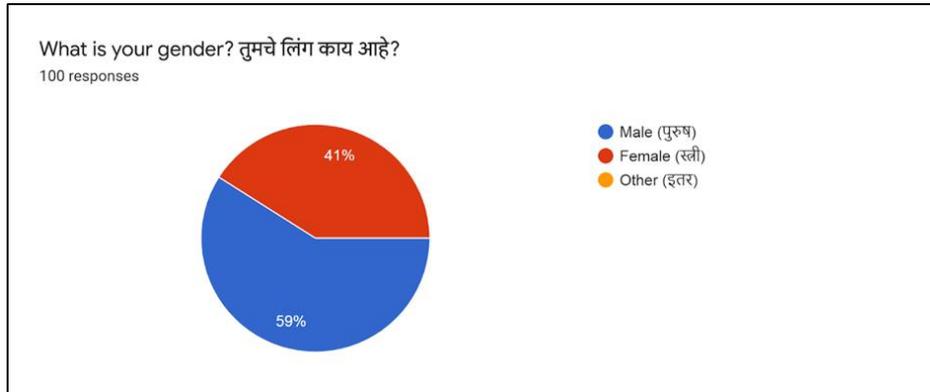


Figure 3.

Interpretation: From the above pie chart it's observed that 59% Male responded. About dry eye syndrome, 41% of females responded about dry eyes syndrome.

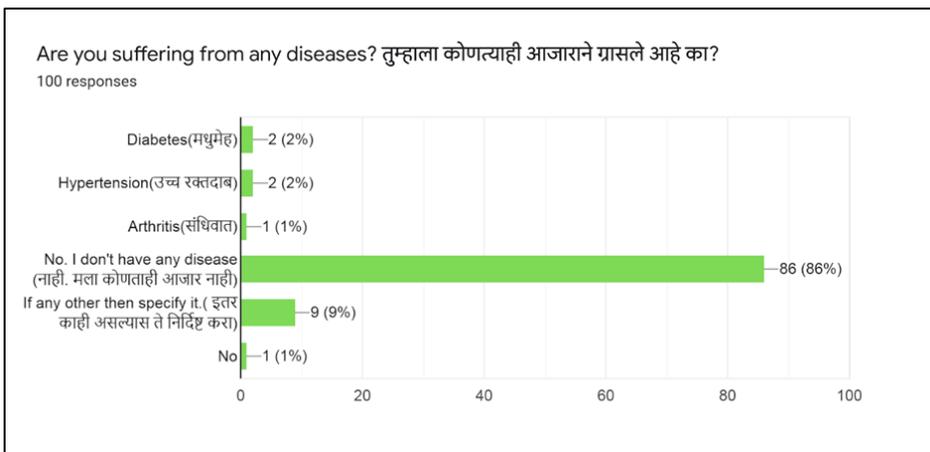


Figure 4.

Interpretation: From the above pie chart, it is observed that 02% of respondents are suffering from hypertension, and 86% responded that they don't suffer from any kind of disease. 02% responded that they suffer from diabetes.

And 01% responded that they are suffering from arthritis. Most of the people are not surfing from any kind of disease in this case but some 05% of people are having the disease.

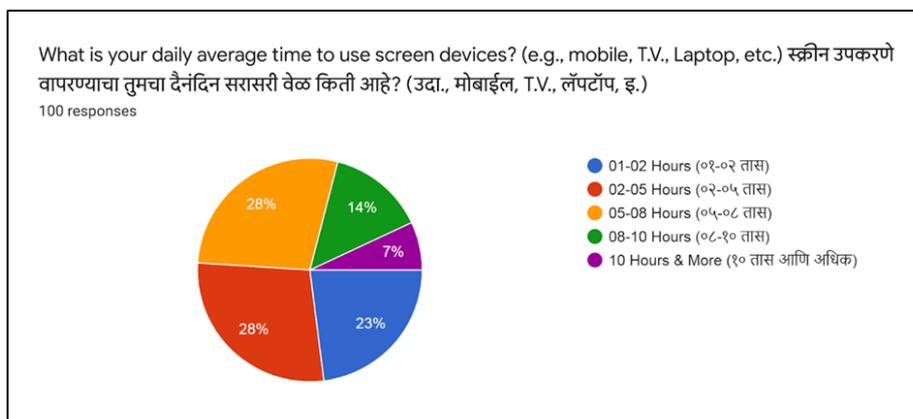


Figure 5.

Interpretation: From above pie chart it observed that 28% of respondents that they used screen time devices for more than 5-8 hr., 28% responded that they use screens for more than 2-5 hr., 14% responded that they used screens more than 8-10 hr., 23% responded that

they use screen more than 1-2 hr. and 07% responded that they use screen more than 10 hr. Due to this pandemic daily hr. of using the screen devices are increasing compared to before the pandemic.

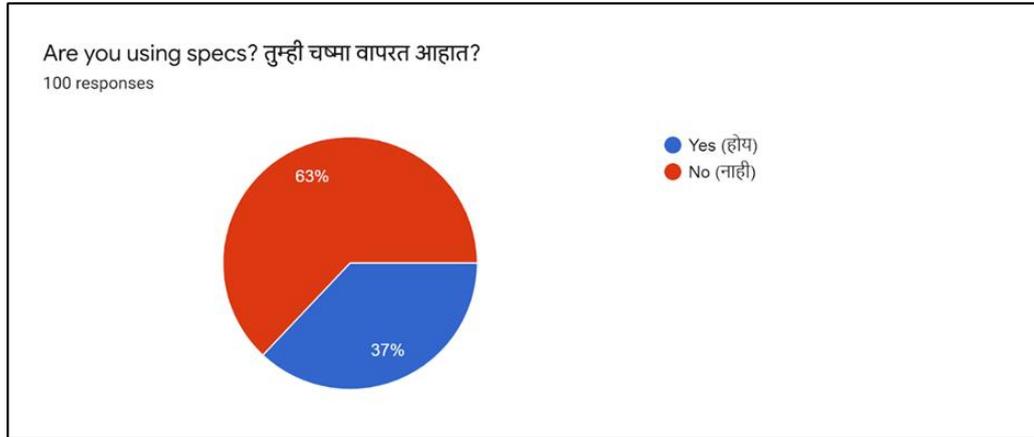


Figure 6.

Interpretation: From the above pie chart it's observed that 63% responded that they don't use specs and 37% responded that they used specs, most of the people don't

have specs, which may have a chance that they will have a dry eye syndrome in future.

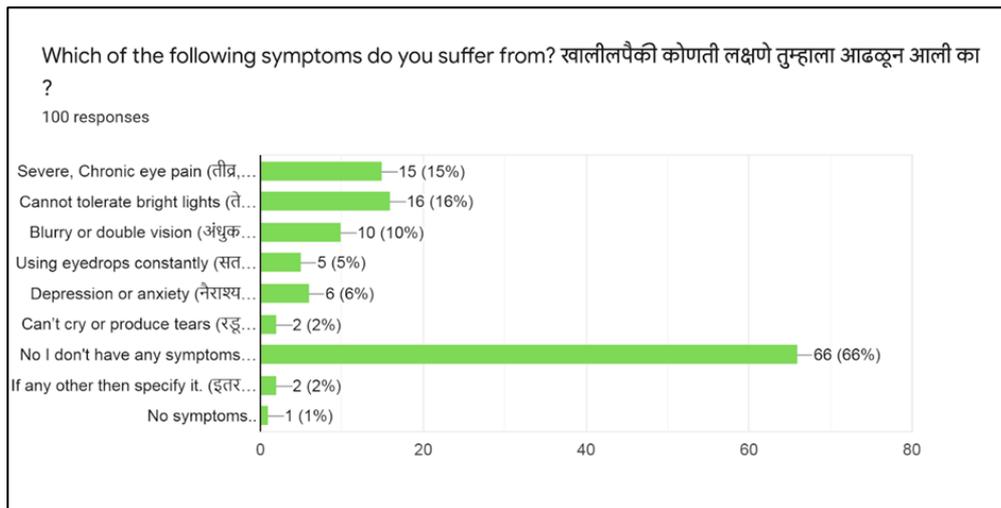


Figure 7.

Interpretation: From the above pie chart it's observed that 66% respond they don't have any symptoms, 15% respond that they have severe chronic eye pain, they cannot tolerate bright lights, 05% responded are

using eye drops, 02% responded that they can't cry or produce tears, 10% responded that they have blurry vision, 06% responded that they suffering from depression. Most people don't have symptoms.

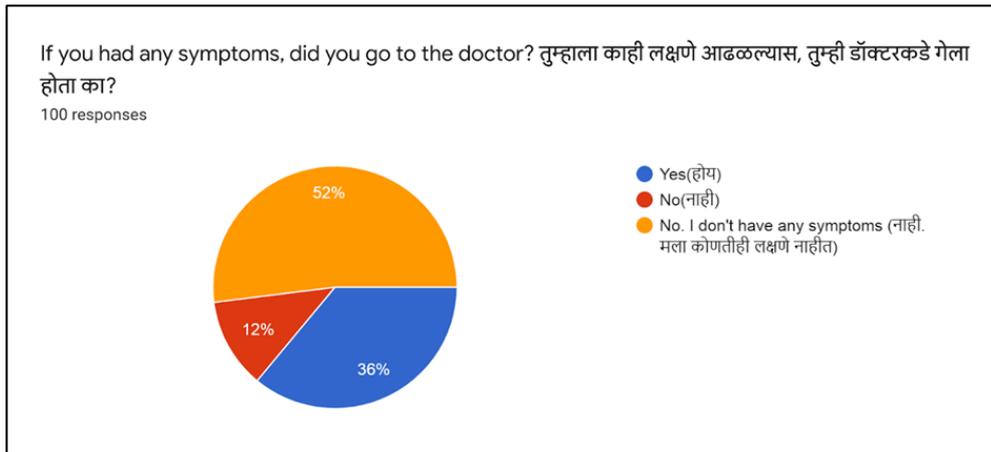


Figure 8.

Interpretation: From the above pie chart, it's observed that 52% respond that they don't have any symptoms and

36% respond that they visit a doctor. And 12% respond that they don't visit the doctor.

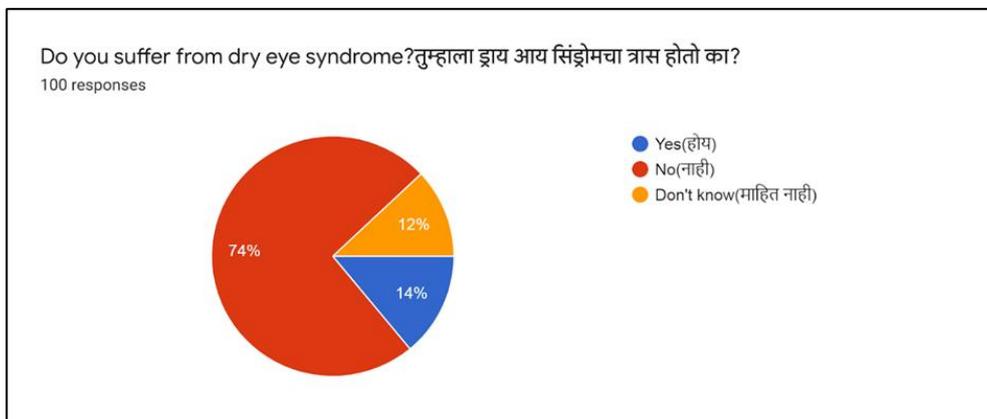


Figure 9.

Interpretation: From the above pie chart, it's observed that 12% respond that they don't know about dry eye syndrome, 74% respond that they are not suffering from

dry eyes syndrome and 14% respond they are suffering from dry eyes syndrome.

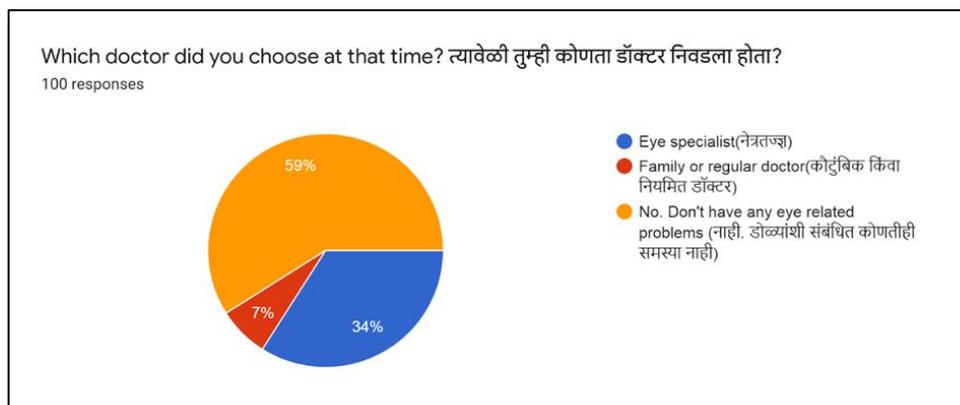


Figure 10.

Interpretation: From the above pie chart it's observed that 59% responded that they don't have any eye-related

problems, 34% responded they visit an eye specialist and 07% responded that they visit family or regular doctor.

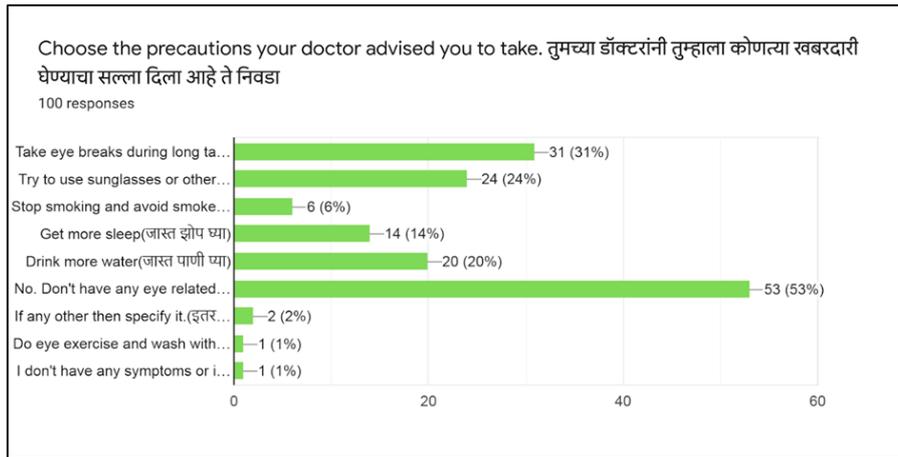


Figure 11.

Interpretation: From the above pie chart, it's observed that 53% responded that they don't have any eye-related problems. 31% responded that doctors recommended taking eye breaks during long tasks. 20% responded that the doctor gave advice that they drink more water, 14%

responded that the doctor recommended that they get more sleep, 06% responded that the doctor recommended that they avoid smoking, and 02% responded to other precautions. 24% responded that doctor recommended that try to use sunglasses.

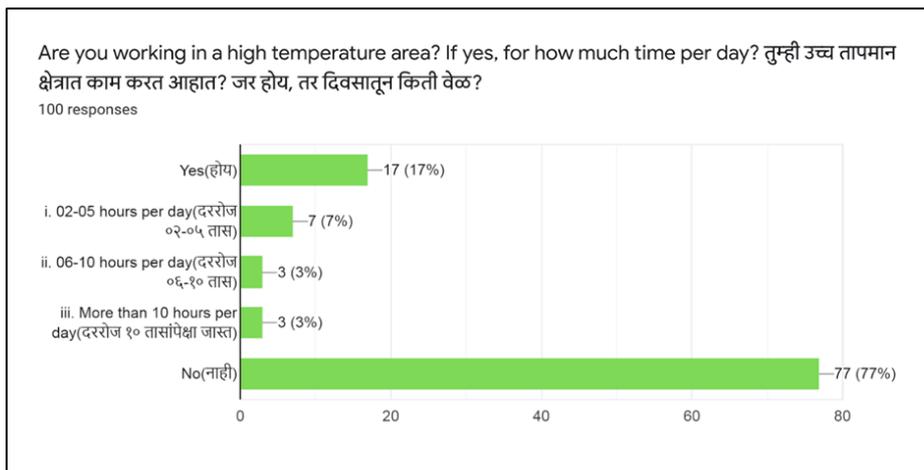


Figure 12.

Interpretation: From the above pie chart it's observed that 77% responded that they don't work in the high-temperature area, 17% responded that they work in high-temperature areas and 07% responded that more than 2 to

5 hr. they work in the high-temperature area and 03% responded that they work more than 6 - 10 hr. per day in high temperature.

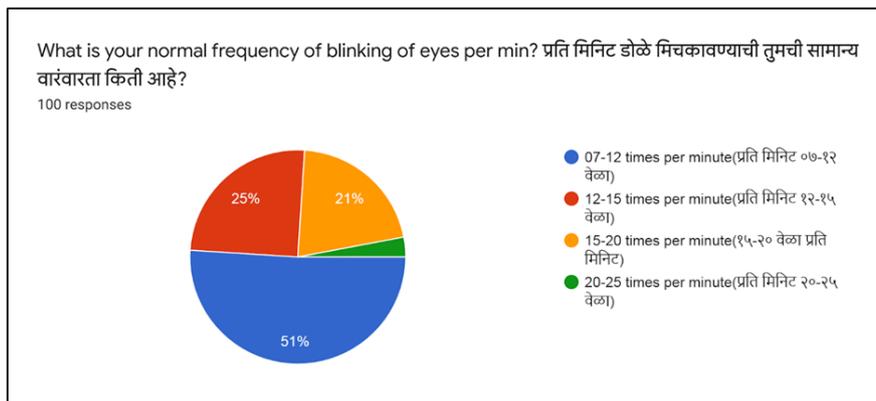


Figure 13.

Interpretation: From the above pie chart it's observed that 51% responded that the normal frequency of a blinking of eyes per minute is 07-12 times per minute, 25% responded that the frequency is 12- 15 times per

minute, 21% responded that the frequency is 15 to 20 time per minutes and 03% responded that the frequency is 20 – 25 time per minutes.

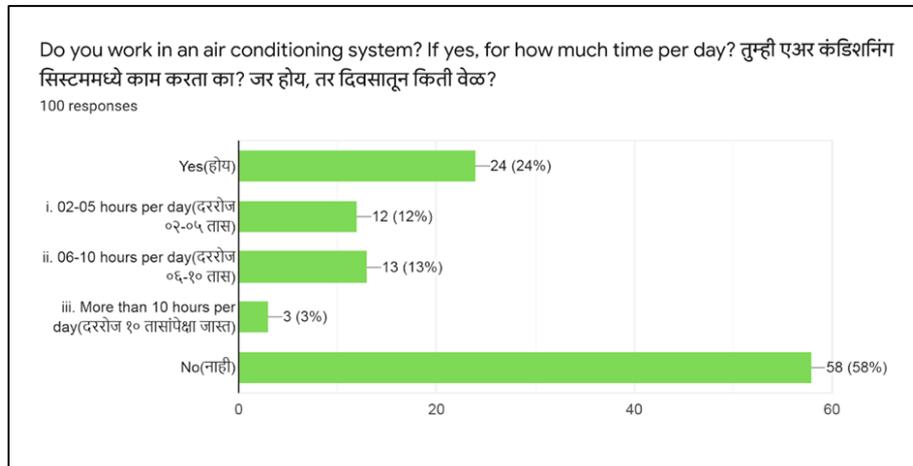


Figure 14.

Interpretation: From the above pie chart, it's observed that 58% responded that they didn't work in an air conditioner system, 24% responded that they work in an air conditioner system, in that 13% responded that they

work more than 6 -10 hr. per day 12% responded that the work then 2 -5 hr. and 03% responded that they work more than 10 hr. per day.

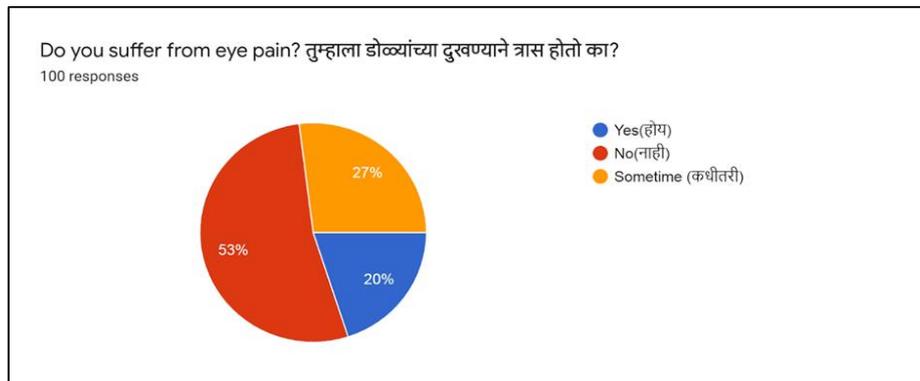


Figure 15.

Interpretation: From the above pie chart it's observed that 53% responded that they don't suffer any eye pain

20% responded that they suffer from eye pain and 27% responded that they have eye pain sometimes.

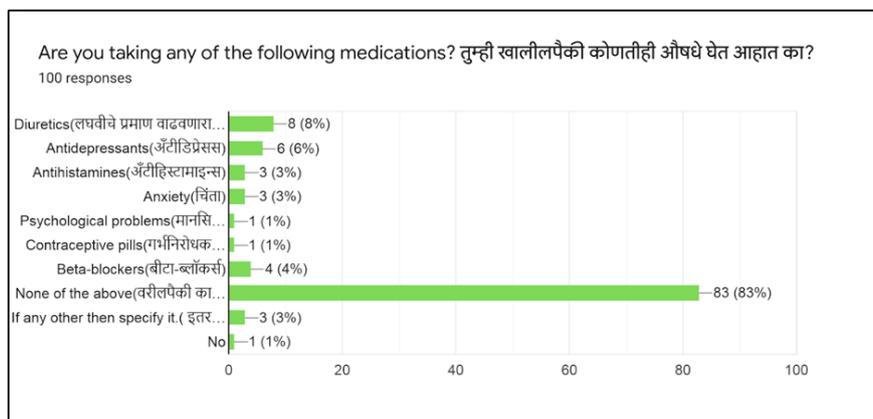


Figure 16.

Interpretation: From the above pie chart, it's observed that 83% responded that they don't take any medicine, 03% responded that they don't take any specific medication they take and 06% responded that they take antidepressant medicine and 01% responded to other

medicines. 08% responded that they used diuretics, 03% responded that they used antihistamines, 01% responded that they used the contraceptive pill, and 04% responded that they used beta blockers.

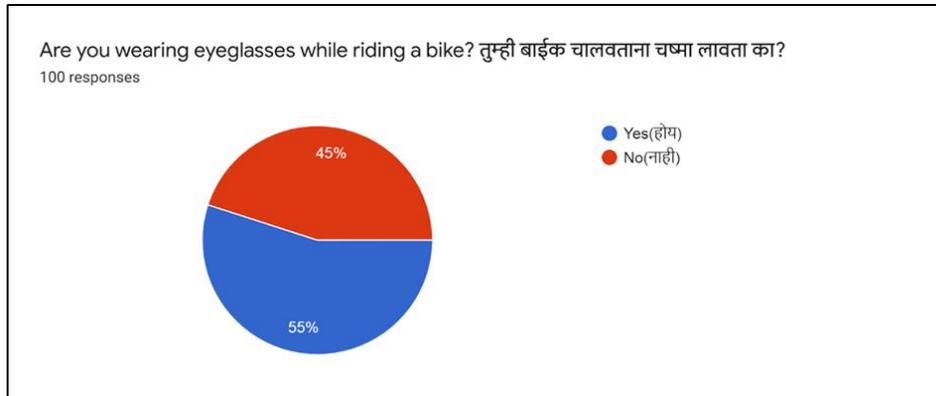


Figure 17.

Interpretation: From the above pie chart, it's observed that 55% responded that they were while riding a bike

and 45% responded that they didn't wear eyeglasses. While riding the bike.

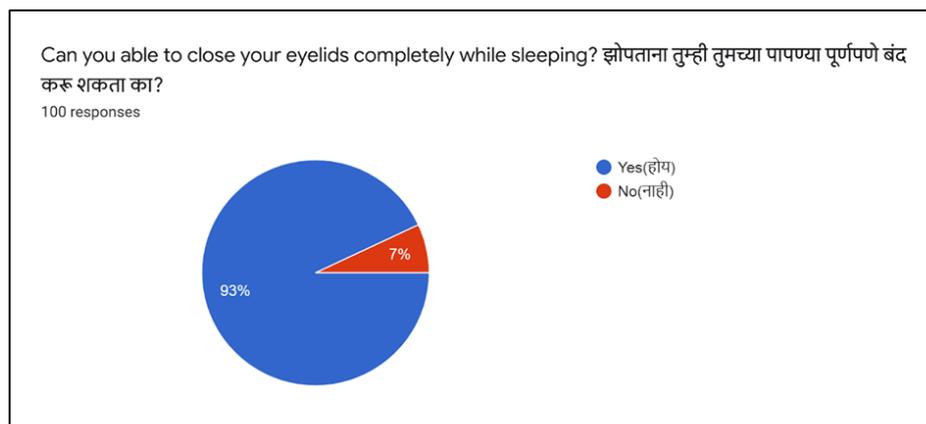


Figure 18.

Interpretation: From the above pie chart, it's observed that 93% responded that they close their eyelids

completely while sleeping. And 07% responded that they can't close their eyelids completely while sleeping.

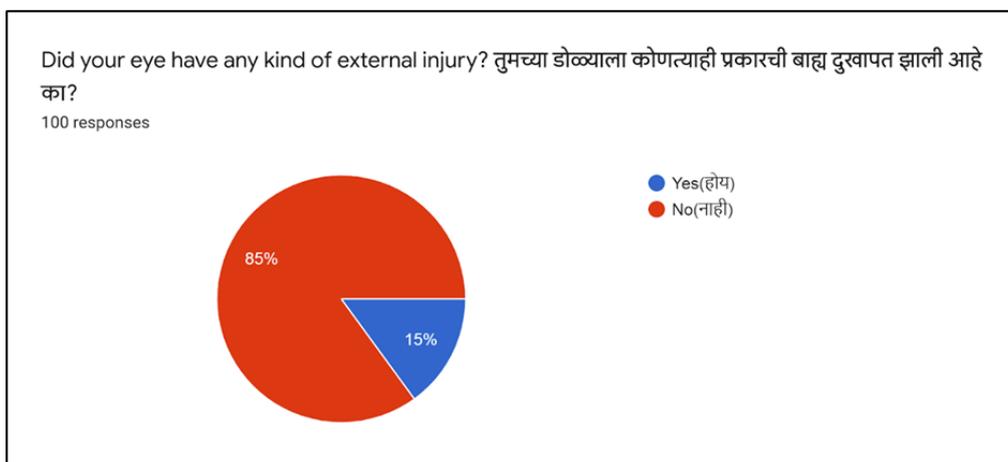


Figure 19.

Interpretation: From the above pie chart, it's observed that 85% responded that they don't have any kind of external injury and 15% responded that they have an external injury.

RESULTS AND DISCUSSION

From the survey responses, it is analyzed that 76% of the respondents were from the age group of 18-30 years. As compared to the females, male candidates are in majority. The maximum population conveyed that they were not suffering from any of the major diseases. Very few were suffering from diabetes, hypertension, and arthritis. Around a quarter of the subjects used screen devices for around 2-5 and 5-8 hrs. daily. Very few of them used the screen devices for more than 10 hrs. More than half of the population that is 63% of them were already using spectacles. No symptoms were shown in most of the respondents. Of the subjects who had the symptoms, most of them consulted the doctor immediately. The majority of the subjects did not suffer from Dry eye syndrome but the minority of them showed the disorder. Of those who had suffered from dry eye syndrome, more than a quarter of the population (34%) consulted an eye specialist, and the rest (7%) visited a general physician. For most of them, doctors advised them to take eye breaks during long tasks (31%), drink more water (20%), and use sunglasses (24%). The majority of the people (77%) were not working in the high-temperature area. Around half (51%) of the subjects had a blinking frequency of 7-12 times per min very few (3%) had a blinking frequency of 20-25 times per min. Most of the population (58%) did not work in the air conditioning system. Around half of the population (53%) did not suffer from eye pain and the majority (83%) of them were not on any medication. Most of the subjects (55%) informed that they wear eyeglasses while riding the bike, while the rest (45%) do not use any protection. The majority of the population (93%) could close their eyelids completely while sleeping and very few of them couldn't (7%) and the majority (85%) of them didn't have any kind of external eye injury.

CONCLUSION

From the above survey studies which are studied regarding causes, detection methods, and treatment of DES we can conclude that, DES cause due to very common factors which can regulate by balancing our diet and healthy lifestyle. The main causes highlighted in most cases are deficiency of vitamin A, Hormone changes.

Other physiological factors also responsible to increase inflammation in the eye by oxidation of cells are interleukins, TNF alpha, and bacterial infections. Also, environmental factors, industry work, and fieldwork also increase the risk of DES. Including a healthy diet, as prescribed by doctors like food that is rich in omega-3, and vitamin A can help to reduce the inflammation of the eye and they also act as antioxidants to prevent oxidation of cells.

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