

## Effects of screen time on eye sight: Survey Based Study

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### ABSTRACT:

The potential damage that screen time may do to one's eyes has come to light due to the increased use of digital devices. This cross-sectional study looks into the relationship between changes in the ocular surface structure and screen exposure. Using participant responses from the digital age, this study investigates the detrimental effects of prolonged screen usage on eyesight, prescriptions, and general eye health. A digital survey was conducted with 199 participants, 41 men and 158 women, using Google Forms. Results were analyzed by running SPSS, calculating chi squares, and figuring out the frequencies yields the findings. A study of 199 participants found that 105 used glasses, with screen time varying from less than an hour to over six hours. Participants took breaks varying from 20 minutes to every hour. Screen time was the primary factor affecting eye health, followed by pollution, genetics, food, and other factors. Most participants used cellphones, laptops, desktop computers, tablets, and televisions. Information about eye health was primarily sourced from healthcare providers. The results draw awareness to a concerning pattern in screen usage and how it affects eye health. Despite wearing glasses and consulting a doctor, many people use screens for extended periods of time without taking breaks. This emphasizes the necessity of responsible screen-use education programs as well as the value of breaks in lowering related hazards.

**KEY WORDS:** Screen Time, Social Media, Digital Survey, Eye health.

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## INTRODUCTION:

With today's modern technology, digital gadgets have become a core component of daily life for people. Everybody is surrounded by screens all the time, whether they are on televisions, computers, tablets, or cellphones(1, 2). Nearly every region of the human body is negatively impacted by inevitable exposure to digital radiation. "Digital blindness" refers to ophthalmological issues that arise from eye strain brought on by prolonged use of digital screens(3). Although it is not a medical word, the term "digital blindness" refers to the eye strain and pain brought on by prolonged usage of digital gadgets. Many professionals' extended use of screens at work may have detrimental effects on their eyes, which has long been a major worry on a global scale. This article explores the idea of "digital blindness," examining its causes and offering strategies for maintaining eye health and vision in the digital age(4).

### **Factors contribute to effects of screentime on eyesight**

Visual fatigue, eye strain, and discomfort are

### **Methods to protect eyes in the digital age**

Overall eye strain can be reduced by lowering the screen's brightness, choosing a larger, suitable font, and modifying the device's color contrast. Another method of protecting the eyes at work is to use specialist glasses to block or filter dangerous blue light(8). The importance of ergonomics in reducing eye strain and musculoskeletal pain has long been recognized. Therefore, maintaining a comfortable distance from the screen and maintaining a suitable sitting posture to keep the screen level right at eye level are necessary for a notable reduction in eye-related symptoms as well as neck, shoulder, and back muscle tension. Regular eye blinking keeps

further exacerbated by poor ergonomics, such as inappropriate ambient lighting and high screen glare. Blue light exposure from digital screens is one of the main causes of digital blindness, though there are other aspects as well(5). Compared to other hues in the visible spectrum of light, this blue light has a higher energy level because of its shorter wavelength. Another effect of the blue light the device emits is disrupted sleep patterns, which can result in daytime weariness(6). Bright blue light, sometimes referred to as high-energy visible light, is emitted by contemporary digital devices including computers, tablets, and smartphones. This usually has a wavelength between 450 and 495 nm. Excessive exposure to light, especially short wavelength light (in the ultraviolet portion of the spectrum), has been linked by a number of authors to glaucomatous changes in the ganglion cells, damaged photoreceptors and retinal pigment epithelium, cataracts, and a predisposition to macular degeneration(7). When working on a screen, a noticeable decrease in eye blinking may also induce dry eyes and irritation

the eyes moist and lessens dryness. Maintaining a consistent blinking pattern is a unique tip that helps keep the tear film between the eyeball and the eyelids stable. The tear film helps keep an eye moist, which prevents dry eyes and the ensuing irritation(9). Establishing a productive routine that involves planning brief breaks from screen time throughout the day gives the eyes enough rest. Digital eye strain can also be lessened by increasing the amount of time spent on non-screen-related activities. To alleviate eye strain from screen time, follow the 20-20-20 Rule, every 20 minutes, take a 20-second break to look at an object 20 feet away. This technique helps the eyes relax and improves concentration (10). Eye strain and discomfort can be considerably decreased by minimizing glare by modifying

ambient light and avoiding excessive brightness from screens and surrounding light sources. Frequent ophthalmological exams can identify potential eye-related problems before they impair a person's vision. In order to identify and manage potential eye problems related to the use of sophisticated digital devices, it is crucial to visit an eye care specialist to monitor and address any underlying difficulties or concerns(11).

### **Herbal plants used in eye care:**

DSS is frequently considered a crucial aspect since it may be the cause of the neuroprotective effects observed in the retina. By improving blood flow to the eyes, ginkgo biloba extract (GBE) has a therapeutic impact on glaucoma patients and may lessen the symptoms of the condition. Ginkgo biloba extracts (GBEs) for eye health, emphasizing their capacity to lower oxidative damage, control inflammation, and shield retinal cells from serious eye conditions (12). Terpenoids, carotenoids, and phenolics are the three main types of chemicals found in saffron. The main constituents of saffron are crocins, crocetins, and picrocrocin. Carotenoids are active ingredients in a number of medicinal medications used in the past 10 years to treat age-related macular degeneration and retinal deformities(13). Curcumin's antioxidant qualities may be the source of its anti-cataract action. The efficacy of Haridra Eye Drops in treating bacterial conjunctivitis was shown in a clinical research. Numerous pharmacological characteristics, such as antioxidant, anti-inflammatory, antimutagenic, antibacterial, and anticancer action, are displayed by curcumin, a naturally occurring polyphenol compound that was extracted from *Curcuma longa* L. demonstrates that a number of eye conditions, including glaucoma, cataract, age-related macular degeneration, diabetic retinopathy, corneal neovascularization, corneal wound healing, dry eye disease, conjunctivitis,

pterygium, and anterior uveitis, may be treated with curcumin(14, 15). Many people use black tea as a natural treatment for eye conditions. Black tea's antioxidants and tannins have antibacterial properties. This is particularly helpful for minor eye infections such as conjunctivitis. Redness and swelling are lessened by applying cool black tea bags to the eyes. This is particularly helpful for eyes that aren't getting enough sleep(16). A cooled black tea infusion calms and lessens eye redness. Additionally, it can be applied to irritation or allergies. Black tea compresses or bags increase blood flow, which benefits the skin surrounding the eyes. Black tea's somewhat hydrating qualities aid in moisturizing the eyes. Eye dryness is lessened by washing or applying a tea leaf compress . To lessen discomfort and eyestrain, a decoction made from a fine powder of crushed seeds is applied to the eyes. Fennel, or *Foeniculum vulgare*, is a vitamin and mineral-rich medicinal plant. It includes phytochemicals including anethole, which have antioxidant and anti-inflammatory qualities and are important for lowering ocular inflammation and enhancing retinal health. Because of its high vitamin C and antioxidant content, citrus limon, or lemon, is useful in preventing oxidative damage and lowering the incidence of eye conditions like cataracts (17).

### **METHODOLOGY**

A digital survey was conducted with 199 participants, 41 men and 158 women, using Google Forms. All the data were arranged and collected in MS-Excel. After collection of the information, the data were coded and entered in SPSS through descriptive statistics consisting of percentages and frequency calculations.

### **RESULTS**

Among the 199 participants, 105 reported using glasses, with 20 of them alternating between different pairs depending on their activities.

Screen time varied, with 79 individuals spending less than an hour, 45 between one and three hours, 2 between four and six hours, and 73 more than six hours on screens daily. When it came to taking breaks during screen usage, 53 participants took breaks every 20 minutes, 85 every hour, 46 did so infrequently, and 15 never took a break. The primary factor affecting eye health, as identified by participants, was screen time for 25 individuals, while pollution was mentioned by 2, genetics by 1, food by 4, and the remaining 167 attributed it to various other factors. Among the participants, 162 used cellphones most often, followed by laptops (23), desktop computers (6), tablets (4), and televisions (4). For information about eye health, 109 participants preferred consulting healthcare providers for their reliability, while 26 relied on online articles, 13 on friends and family, and 48 turned to social media as their main source of information.

## DISCUSSION:

52.8% of individuals (105/199) reported wearing spectacles, which suggests that visual abnormalities such as myopia, hyperopia, or presbyopia are quite common. Of these, 19% (20/105) switched between pairs of spectacles, indicating a wide range of visual requirements for particular tasks like reading, using screens, or going outside(18). The high rate of corrective lens use emphasizes how crucial routine eye exams are for managing refractive problems. The increasing use of digital devices, which can worsen visual strain, may be the reason for the necessity for many pairs of glasses. Awareness efforts must to inform people on how to wear eyeglasses correctly and stress the value of task-specific glasses for work involving screens or for protection outside(19).

Data on screen time shows a worrying trend of extended use of digital devices: 73 participants (36.7%) used screens for more than six hours

every day. The percentage of participants who restricted their screen time to less than an hour was just 79, or 39.7%. Overuse of screens is consistent with contemporary work and lifestyle habits, but it also raises questions regarding digital eye strain (DES) and its long-term implications, such as possible connections to the development of myopia and dry eye syndrome. DES, which can result in symptoms like headaches, dry eyes, and eye tiredness, is more likely to strike participants who use screens for extended periods of time. Employers and educators ought to encourage better screen behaviors, like minimizing needless screen time, utilizing blue light filters, and supporting ergonomic configurations.

53 individuals, or 26.6%, followed the suggested 20-minute break period. Of the 85 participants, 42.7% took hourly breaks. 7.5% (15 individuals) never took breaks, whereas 23.1% (46 people) took them occasionally. According to this distribution, a sizable percentage of participants (more than 30%) are not using efficient break-taking techniques, which raises their risk of developing digital eye strain. Not taking frequent breaks worsens eye strain from screens and lowers productivity. To preserve eye health and lessen the negative effects of extended digital screen focus, it is imperative to take frequent, brief rests. The 20-20-20 rule, which states that you should focus on anything 20 feet away for 20 seconds every 20 minutes, should be promoted by awareness campaigns. Scheduled breaks can also be incorporated into working policies by employers.

Participants gave the following explanations when questioned about the elements influencing eye health. The most often found component is screen time (12.6%). Food, genetics, and pollution were barely mentioned. 167 participants, or 83.9%, gave the response "various other factors," which may indicate a lack of awareness or understanding of multiple influences.

This lack of agreement implies that individuals are aware of the negative effects of screen time but are unaware of other important aspects, such as nutrition, hydration, UV exposure, and general health. A lack of knowledge about all aspects of eye health may cause people to overlook important preventative actions like wearing sunglasses that block UV rays or eating a diet high in nutrients. Educational programs must to emphasize fostering a comprehensive awareness of eye health, encompassing screen usage, environmental factors, and dietary practices(20). The prevalence of cellphones as the main device (81.4% of participants) is indicative of modern lifestyles, where smartphones are essential for work, play, and communication. Televisions (2% each), tablets, laptops (11.6%), and desktop computers (3% each) had a far lower impact. Because of the small screen size and tight viewing distance, prolonged cellphone use might cause eye strain. Myopia is also exacerbated by this habit, especially in younger people(21). The necessity of minimizing close-up screen exposure, utilizing larger devices where feasible, and adhering to appropriate ergonomics such as keeping a safe viewing distance—should be emphasized by eye health professionals.

Healthcare professionals (54.8%) seek precise and trustworthy data. Secondary sources included friends and family (6.5%), social media (24.1%), and internet articles (13.1%). More than half of participants trust healthcare providers, which is good, but the substantial dependence on social media for information about eye health raises concerns about the possibility of false information. The increasing use of social media in health communication has the potential to either inform people with factual information or deceive them with unreliable information. It is advised that eye care providers take an active role on social media sites in order to offer reliable, easily obtainable information. Campaigns for fact-checking could also aid in combating false information on the internet.

## CONCLUSION:

Twenty pairs of glasses alternated for particular activities, and 105 of the 199 individuals wore spectacles. With 73 people using screens for more than six hours every day and only 79 for less than an hour, screen usage was substantial. 53 people took breaks every 20 minutes, 85 every hour, 46 occasionally, and 15 never. These people had different break patterns. Twenty-five people named screen time as the primary factor influencing eye health, whereas others mentioned heredity, pollution, food, and other variables. The majority of participants mostly utilized their phones, with laptops, desktop computers, tablets, and televisions following closely behind. 109 people trusted their healthcare practitioners for information about eye health, while others turned to friends and family, online publications, and social media(22). Since vision is vital for daily tasks, education, employment, and general well-being, eye health is critical to preserving quality of life. If left untreated, poor eye health can cause discomfort, decreased productivity, and even irreversible vision loss. Regular eye exams, good screen habits, a healthy diet that includes foods high in vitamins A, C, E, and omega-3 fatty acids, protective measures like wearing sunglasses to protect our eyes from UV rays and using protective eyewear when necessary, and managing underlying conditions like diabetes and hypertension to prevent related eye issues are all ways to maintain eye health.

| <b>Table 1: Results obtained from Survey</b>                    |              |                |                           |
|-----------------------------------------------------------------|--------------|----------------|---------------------------|
| <b>Gender</b>                                                   | <b>Total</b> | <b>Percent</b> | <b>Cumulative Percent</b> |
| Female                                                          | 158          | 79.4           | 79.4                      |
| Male                                                            | 41           | 20.6           | 100                       |
| Total                                                           | 199          | 100            |                           |
| <b>Currently Wear Spectacles</b>                                |              |                |                           |
| No                                                              | 94           | 47.2           | 47.2                      |
| Yes                                                             | 105          | 52.8           | 100                       |
| Total                                                           | 199          | 100            | 100                       |
| <b>Do You Use Different Spectacles For Different Activities</b> |              |                |                           |
|                                                                 | 15           | 7.5            | 7.5                       |
| No                                                              | 164          | 82.4           | 89.9                      |
| Yes                                                             | 20           | 10.1           | 100                       |
| Total                                                           | 199          | 100            | 100                       |
| <b>Hours Spent Per Day On Screen</b>                            |              |                |                           |
| less than 1 hour                                                | 79           | 39.7           | 39.7                      |
| 1-3 hours                                                       | 45           | 22.6           | 62.3                      |
| 4-6 hours                                                       | 2            | 1              | 63.3                      |
| more than 6hours                                                | 73           | 36.7           | 100                       |
| Total                                                           | 199          | 100            |                           |
| <b>Breaks In Between Screen Time</b>                            |              |                |                           |
| every 20minutes                                                 | 53           | 26.6           | 26.6                      |
| every hour                                                      | 85           | 42.7           | 69.3                      |
| Rarely                                                          | 46           | 23.1           | 92.5                      |
| Never                                                           | 15           | 7.5            | 100                       |
| Total                                                           | 199          | 100            |                           |
| <b>Significant Factors Affecting Eye Health</b>                 |              |                |                           |
| screen time                                                     | 25           | 12.6           | 78.1                      |
| pollution                                                       | 2            | 1              | 84.4                      |
| genetics                                                        | 1            | 0.5            | 87.5                      |
| diet                                                            | 4            | 2              | 100                       |
| Total                                                           | 32           | 16.1           |                           |
| <b>Significant Factors Affecting Eye Health</b>                 |              |                |                           |
| smart phone                                                     | 162          | 81.4           | 81.4                      |
| tablet                                                          | 4            | 2              | 83.4                      |
| laptop                                                          | 23           | 11.6           | 95                        |
| desktop computer                                                | 6            | 3              | 98                        |
| television                                                      | 4            | 2              | 100                       |
| Total                                                           | 199          | 100            |                           |
| <b>Most Frequent Screen Use</b>                                 |              |                |                           |
| Online articles                                                 | 26           | 13.1           | 13.1                      |
| Social media                                                    | 48           | 24.1           | 37.2                      |
| Healthcare professionals                                        | 109          | 54.8           | 92                        |
| Friends and family                                              | 16           | 8              | 100                       |
| Total                                                           | 199          | 100            |                           |

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