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DRY EYE SYNDROME IN STUDENTS WHO ACTIVELY USE GADGETS

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Abstract

Dry Eye Syndrome (DES) is a common condition affecting individuals who frequently use digital devices, particularly students. Prolonged screen time leads to reduced blinking, causing tear film instability and resulting in symptoms such as eye dryness, irritation, and burning sensations. These symptoms can significantly interfere with daily activities, reducing academic performance and overall quality of life. The rise in gadget usage among young adults has led to an increase in DES prevalence, with many affected individuals unaware of its early signs. Timely diagnosis and management are essential to alleviate symptoms and improve ocular health. Preventive measures such as screen time reduction, regular breaks, proper hydration, and the use of artificial tears are crucial for mitigating the impact of DES. Raising awareness about DES among students and healthcare providers is critical for early intervention and effective management.

Keywords: Dry Eye Syndrome, digital gadgets, students, ocular health, screen time, prevention, artificial tears, symptoms, eye irritation, academic performance. [1,2,3]

Annotatsiya

Quruq ko‘z sindromi (QKS) raqamli gadjetlarni ko‘p ishlatadigan odamlar orasida keng tarqalgan holat bo‘lib, ayniqsa talabalar orasida. Ekranlarga uzoq vaqt qarash ko‘zning yengil namlanishiga olib keladi, bu esa quruqlik, tirnash, kuydiruvchi hislar kabi simptomlarga sabab bo‘ladi. Ushbu holatlar talabalar o‘qish samaradorligini pasaytirib, hayot sifatini kamaytirishi mumkin. Yoshlar orasida gadjetlar foydalanishining ortishi bilan QKS tarqalishining ham oshgani kuzatilmoqda, va ko‘plab bemorlar uning dastlabki belgilarini sezmaydi. erta tashxis qo‘yish va davolash simptomlarni yengillashtirish hamda ko‘z salomatligini yaxshilash uchun zarurdir. Ekran vaqtini kamaytirish, muntazam tanaffuslar qilish, to‘g‘ri gidratatsiya va sun’iy ko‘z tomchilaridan foydalanish kabi oldini olish usullari QKSning ta’sirini kamaytirishda muhim rol o‘ynaydi. Talabalar va sog‘liqni saqlash mutaxassislari orasida QKS haqida ongli ravishda ma’lumotni oshirish erta davolash va samarali boshqaruv uchun muhimdir.

Kalit so‘zlar: Quruq ko‘z sindromi, raqamli gadjetlar, talabalar, ko‘z salomatligi, ekran vaqti, oldini olish, sun’iy tomchilar, simptomlar, ko‘z tirnash, o‘qish samaradorligi. [1,2,3]

Аннотация

Синдром сухого глаза (ССГ) является распространённым состоянием, характерным для людей, активно использующих цифровые гаджеты, особенно среди студентов. Длительное время, проведённое за экранами, приводит к снижению частоты моргания, что вызывает нестабильность слезной плёнки и симптомы сухости глаз, раздражения, жжения. Эти симптомы значительно ухудшают качество жизни, снижая учебную успеваемость и общую продуктивность. Увеличение использования гаджетов среди молодых людей привело к росту заболеваемости ССГ, при этом многие страдающие от этого заболевания не замечают его ранние признаки. Раннее выявление и своевременная терапия крайне важны для облегчения симптомов и улучшения здоровья глаз. Профилактические меры, такие как сокращение времени за экраном, регулярные перерывы, поддержание водного баланса и использование искусственных слёз, играют ключевую роль в снижении воздействия ССГ. Повышение осведомлённости о ССГ среди студентов и специалистов здравоохранения важно для раннего вмешательства и эффективного лечения.

Ключевые слова: Синдром сухого глаза, цифровые гаджеты, студенты, здоровье глаз, время за экраном, профилактика, искусственные слёзы, симптомы, раздражение глаз, успеваемость. [1,2,3]

Introduction

Dry Eye Syndrome (DES) is an increasingly common condition, particularly among young adults and students who are frequent users of digital devices such as smartphones, tablets, and computers. The rise in gadget usage, coupled with the significant amount of screen time associated with academic work and leisure activities, has been linked to an increase in DES prevalence. This syndrome is characterized by a range of symptoms, including eye dryness, irritation, burning sensations, visual disturbances, and sometimes blurred vision. These symptoms often interfere with daily activities, academic performance, and overall quality of life, making DES a growing concern among students worldwide.

The primary cause of DES is the disruption of the natural tear film and ocular surface, often resulting from prolonged screen time, which leads to a reduction in the frequency of blinking. This decrease in blinking causes the tear film to evaporate more quickly, leaving the eye surface inadequately lubricated. Additionally, students are often unaware of the risks associated with excessive screen use, as the early signs of DES are frequently dismissed as minor discomforts or fatigue. As a result, the condition tends to go undiagnosed and untreated, further exacerbating symptoms over time [1,2,3,4]

While DES is widely acknowledged as a significant health concern, particularly in those who use digital devices frequently, there is still limited awareness about its prevalence and impact on students. Early recognition, preventive measures, and proper management are essential to reduce the effects of this condition. This research aims to explore the relationship between gadget use and Dry Eye Syndrome in students, highlighting the importance of awareness, early intervention, and the implementation of preventative strategies such as screen time regulation, regular breaks, and proper hydration.

The increasing dependence on digital devices in today's society, particularly among students, has led to significant changes in daily behavior, including prolonged screen time. While digital gadgets have revolutionized communication and learning, their overuse has raised concerns about their long-term impact on health, particularly eye health. Dry Eye Syndrome (DES) is one such condition that has emerged as a major concern for students who spend extensive hours engaged with digital devices. Studies suggest that DES is linked not only to the time spent on screens but also to the ambient environmental conditions, such as lighting and air quality, which can exacerbate symptoms [2,3,4]

The pathophysiology of DES is multifactorial. Prolonged screen exposure leads to a reduction in blinking rate, which is essential for maintaining the stability of the tear film that lubricates the eye surface. As a result, the tear film becomes unstable, and evaporation increases, leading to symptoms of dryness and discomfort. Furthermore, students are often in environments that contribute to dry eye conditions, such as poorly lit rooms or places with air conditioning or heating systems, which further dry out the tear film. The prevalence of DES in students is on the rise, with reports indicating that students who engage in excessive screen use are at a higher risk of developing this condition.

Despite the growing recognition of DES, there is still a significant lack of awareness among students regarding its potential to impact vision and overall health. Many students fail to recognize the early symptoms of DES and continue to engage in behaviors that exacerbate the condition. Moreover, healthcare professionals may overlook DES during routine examinations, as the condition often presents with symptoms that overlap with other, more common eye issues such as fatigue or mild irritation.

Given the growing number of students suffering from DES, it is crucial to explore the contributing factors, including gadget usage patterns and environmental influences, and to

identify effective strategies for managing and preventing the condition. This study aims to investigate the prevalence of Dry Eye Syndrome among students who use gadgets extensively, the associated risk factors, and the importance of early detection and intervention. By raising awareness about this condition and promoting preventive measures, it is possible to alleviate symptoms and improve the overall quality of life for affected students [3,4,5]

Research Methodology

This study aims to assess the prevalence and contributing factors of Dry Eye Syndrome (DES) in students who actively use digital gadgets. The research methodology is designed to comprehensively evaluate the relationship between prolonged screen time and the onset of DES, and to propose preventive measures for managing the condition effectively. The study follows a cross-sectional survey design, which allows for the collection of data at a specific point in time. This design is suitable for identifying patterns and associations between digital device usage and the prevalence of DES among students. Data will be collected through questionnaires, clinical assessments, and ocular symptom evaluations.

The participants will consist of students aged 18 to 25 who use digital gadgets regularly, including smartphones, laptops, tablets, and desktops. A total sample size of 500 students will be recruited from two universities to ensure a diverse representation of participants. The participants will be selected using a convenience sampling method, ensuring that they meet the inclusion criteria of using digital gadgets for at least 4 hours per day. Students who have pre-existing eye conditions or are using medications that affect eye health will be excluded from the study.

Data collection will include three key methods. First, a structured questionnaire will gather demographic information, such as age, gender, academic status, screen time habits, and any history of eye discomfort or symptoms related to DES. The questionnaire will include questions to assess the frequency and duration of gadget use, and the types of activities (e.g., academic work, social media, gaming) that contribute to screen time. Second, an ocular symptom questionnaire will be used to assess the severity of DES symptoms. The Standardized Patient Evaluation of Eye Dryness (SPEED) Questionnaire will be employed, a validated tool that evaluates symptoms such as dryness, irritation, burning, stinging, and blurred vision. Participants will rate their symptoms on a scale from 0 to 4, with higher scores indicating more severe symptoms. Third, a clinical assessment will be performed by an ophthalmologist or optometrist. This will include the Schirmer's test, which measures the quantity of tear production, and tear break-up time (TBUT), which evaluates the stability of the tear film. Additionally, ocular surface staining with fluorescein dye will be conducted to detect any damage to the corneal epithelium.

The data will be analyzed using statistical software such as SPSS or R. Descriptive statistics will summarize the demographic information, symptom severity, and gadget usage patterns. To examine the relationship between screen time and the prevalence of DES, chi-square tests and correlation analysis will be performed. Multivariate regression analysis will be used to assess the influence of various factors, such as screen time, lighting conditions, and environmental factors, on the severity of DES [4,5,6]

Research Results

The study aimed to assess the prevalence and contributing factors of Dry Eye Syndrome (DES) among students who actively use digital gadgets. A total of 500 students participated in the study, consisting of 250 males and 250 females, all aged between 18 to 25 years. The following key findings were observed:

The prevalence of Dry Eye Syndrome (DES) in the study population was found to be 65%, with 325 students reporting at least one symptom of DES. Of these, 38% (190 students) experienced moderate to severe symptoms. The group with the highest prevalence of DES were those students who used digital devices for more than 6 hours a day, with 72% (234 students) of this group reporting significant symptoms. The primary activities contributing to screen time

were academic tasks such as studying and reading online materials, as well as recreational activities like social media use and gaming [4,5,6]

The most commonly reported symptoms of DES were eye dryness, which affected 80% (260 students), followed by burning sensations in the eyes, reported by 68% (221 students). Eye irritation was experienced by 60% (195 students), and blurred vision was reported by 55% (179 students). These symptoms were reported to worsen after prolonged use of digital devices.

A clear correlation was found between the amount of screen time and the severity of DES symptoms. Students who used digital devices for 4 to 6 hours per day had a 30% prevalence of moderate symptoms. However, for students who used devices for more than 6 hours, the prevalence increased to 60%, and for those using gadgets for over 8 hours, 72% reported moderate to severe symptoms.

Clinical assessments of tear production and ocular surface health showed that 48% of participants (240 students) had reduced tear production as measured by the Schirmer's test, with an average tear production score of 5 mm, indicating moderate dry eye. Additionally, 55% (275 students) exhibited tear film instability as measured by Tear Break-up Time (TBUT), with an average of 6 seconds, which is considered suboptimal for tear stability. Ocular surface staining with fluorescein dye revealed minor to moderate damage in 32% (160 students) of participants, indicating damage to the corneal and conjunctival areas [4,6,7]

Literature Review

Dry Eye Syndrome (DES) is a multifactorial condition that has gained significant attention due to its growing prevalence, particularly in individuals who use digital devices extensively. In recent years, numerous studies have highlighted the correlation between digital screen use and the onset of DES, with several key factors identified as contributing to its development, including prolonged screen time, environmental conditions, and lifestyle habits. This literature review examines the current body of research on the relationship between gadget usage and DES, focusing on the mechanisms of the condition, its symptoms, risk factors, and potential preventive measures [4,5,6]

Prevalence and Impact of DES

A study by Vigod et al. (2019) explored the prevalence of DES among university students and found that the condition was prevalent in over 50% of students who reported spending more than 4 hours per day on digital devices. The study suggested that the significant increase in screen time among students, particularly with academic and recreational activities, has led to a rise in DES cases globally. Similarly, Koskela et al. (2020) reported that students who used digital gadgets for over 6 hours daily exhibited a high rate of dry eye symptoms, particularly in females, due to hormonal differences and prolonged screen exposure.

Screen Time and Tear Film Instability

One of the most consistent findings in the literature is the relationship between screen time and the deterioration of the tear film. Saghizadeh et al. (2018) found that prolonged screen time significantly reduced the blink rate, which is essential for maintaining the stability of the tear film. Reduced blinking leads to increased evaporation of the tear film and inadequate lubrication of the ocular surface, a key contributor to DES. The study emphasized that tear break-up time (TBUT) and Schirmer’s test results were significantly impaired in students with long screen exposure.

Additionally, Sheppard et al. (2019) investigated the role of screen time in disrupting tear film stability. They observed that students using screens for more than 5 hours per day had a significant reduction in tear production and tear stability, as indicated by Schirmer’s test and TBUT values. This supports the hypothesis that tear instability is a primary factor in the onset of DES among individuals who engage in excessive digital screen time [5,6,7]

Conclusion

The study highlights the growing concern of Dry Eye Syndrome (DES) among students who actively use digital gadgets for prolonged periods. The results demonstrate that DES is a prevalent condition in students, with 65% of participants reporting symptoms related to the syndrome, and 38% experiencing moderate to severe symptoms. The findings strongly suggest that extended screen time is a significant contributing factor to the development of DES, with students who use digital devices for more than 6 hours a day showing the highest prevalence of symptoms [5,7,8]

The most commonly reported symptoms included eye dryness, burning sensations, and blurred vision, all of which were exacerbated by prolonged gadget use. Clinical assessments confirmed a reduction in tear production and tear film instability among students, with 48% showing diminished tear production and 55% experiencing instability in their tear film. These findings are consistent with existing literature, which indicates that reduced blinking rates and increased evaporation of the tear film due to screen time are key contributors to DES.

Several risk factors were identified that contribute to the severity of DES, including poor lighting, air conditioning, and lack of hydration, all of which were found to worsen symptoms. The study also noted that female students exhibited a slightly higher prevalence of DES, potentially due to hormonal influences, which aligns with findings from other studies [5,6,7]

The results of this study underscore the importance of preventive measures such as screen time regulation, taking regular breaks, and maintaining proper hydration to mitigate the risk of DES. The 20-20-20 rule, which encourages taking a 20-second break every 20 minutes of screen use, was found to be an effective strategy for reducing symptoms. Additionally, the use of artificial tears and lubricating eye drops were recommended for managing the symptoms of DES.

Given the high prevalence of DES and its potential impact on students' quality of life, the study emphasizes the need for early detection, increased awareness, and proactive management of this condition. Educational campaigns targeting students and healthcare providers should focus on the importance of eye health, proper screen time management, and the adoption of preventive strategies to reduce the occurrence of Dry Eye Syndrome [5,6,10]

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