



INCIDENCE OF DRY EYES IN SMARTPHONE USERS AMONG UNDERGRADUATES

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ABSTRACT

Digital technology advances have increased smartphone usage, particularly among undergraduates who use these devices for communication, entertainment, and education. However, prolonged screen time negatively impacts eye health. Smartphone screens' small size and close viewing distance increase accommodative demand on eye muscles, causing fatigue, blurring, and decreased blink rate, leading to Dry Eye Disease (DED). Blue light emission damages tear film and increases inflammatory markers. This study examined the relationship between smartphone usage and DED in undergraduates. A questionnaire and clinical tear film evaluation were conducted on 200 undergraduates from Guntur Medical College, Guntur. Results showed 84% experienced dry eye symptoms, 48% were clinically diagnosed with DED, 8% had severe dry eye, 5% had meibomian gland dysfunction, and 3% were contact lens users. Early identification of risk factors and DED diagnosis can prevent serious complications. This research highlights the significant prevalence of dry eye symptoms in smartphone-using students.

KEYWORDS : dry eye disease, smartphone usage, undergraduates, digital eye strain**INTRODUCTION**

Dry Eye Disease (DED) is a multifactorial problem with increasing global prevalence. The Dry Eye Workshop (DEWS) in 2007 defined DED as 'a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface.' With recent technological advances, prolonged screen time has been identified as a major risk factor, leading to decreased blink rate and contributing to the surge in DED cases.

Studies have reported varying prevalence rates of DED in India, with predictions that cases will increase significantly due to lifestyle and technological changes. Despite the prevalence of smartphone use, little research has been conducted specifically on undergraduate students, who often use smartphones for prolonged periods for various purposes. This study aims to determine the relationship between smartphone use and DED, focusing on undergraduate students.

MATERIALS AND METHODS

This facility-based cross-sectional study was conducted at the outpatient department of the Department of Ophthalmology, Guntur Medical College. Institutional ethics clearance was obtained, and informed consent was taken from all participants.

A pre-designed, semi-structured questionnaire in the local language was used to collect data on:

- Basic socio-demographic information
- Duration of smartphone usage (0-3 years vs. more than 3 years)
- Daily screen time (less than 3 hours vs. more than 3 hours)
- Dry eye symptoms (never, sometimes, often, always)
- Primary purpose of smartphone usage (entertainment, chatting, communication, browsing, educational)

Clinical examination included evaluation of the tear film using Schirmer's test and Tear Film Break-Up Time (TBUT). A total of 200 undergraduate students were included in the study.

RESULTS

The study included 200 undergraduate students with equal gender distribution. The mean age was 21.5 years (range: 18-25 years). The majority (176 students) were from urban areas.

Duration and Usage Patterns:

- 178 students (89%) used smartphones for more than 3 years
- 188 students (94%) used smartphones for more than 3 hours daily

Symptom Distribution:

- 105 students (52.5%) experienced dry eye symptoms often
- 47 students (23.5%) experienced symptoms sometimes
- 32 students (16%) never experienced symptoms

- 16 students (8%) always experienced symptoms

Primary Usage Purpose:

- Educational purposes: 126 students (63%)
- Entertainment: 34 students (17%)
- Communication: 24 students (12%)
- Chatting: 16 students (8%)

Clinical Findings:

- Schirmer's test showed 96 students with ≤ 10 mm wetting, including 6 with severe dry eye (< 5 mm wetting)
- TBUT results showed 89 students with break-up time around 10 seconds, with 6 having ≤ 7 seconds

Overall, 168 students (84%) reported dry eye symptoms, and 96 students (48%) were clinically diagnosed with DED.

DISCUSSION

The study demonstrates a significant prevalence of dry eye symptoms among undergraduate students using smartphones. The high percentage (84%) of students experiencing symptoms aligns with the growing concern about digital eye strain. The predominant use of smartphones for educational purposes (63%) may exacerbate the condition, as academic activities often require sustained attention and reduced blink rates.

The relationship between prolonged smartphone usage and DED is multifactorial, involving accommodative stress, reduced blink frequency, and blue light exposure. The clinical findings using Schirmer's test and TBUT confirm the high incidence of dry eye among this demographic.

These findings emphasize the need for increased awareness about digital eye strain and implementation of preventive measures in educational institutions.

CONCLUSION

This study reveals a high prevalence of dry eye symptoms (84%) among undergraduate smartphone users, with 48% clinically diagnosed with DED. The predominant use of smartphones for educational purposes highlights the need for eye health awareness programs in academic institutions. Implementing preventive strategies such as regular breaks, proper screen distance, and artificial tears can significantly reduce the impact of digital eye strain on student populations.

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