



Correlation Between Night-Time Screen Use and Severity of Evaporative Dry Eye in Medical Students

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Abstract

Background: Excessive digital screen exposure has become increasingly associated with dry eye disease among young adults. Medical students are particularly vulnerable due to prolonged academic screen exposure and altered sleep patterns.

Aim: To evaluate the correlation between night-time screen use and severity of evaporative dry eye among medical students.

Methods: A hospital-based cross-sectional observational study was conducted among 100 medical students aged 18–30 years. Night-time screen exposure was assessed using a structured questionnaire. OSDI scoring, TBUT, Schirmer's test, and meibomian gland evaluation were performed.

Results: Students with prolonged night-time screen exposure demonstrated significantly lower TBUT values and higher OSDI scores.

Conclusion: Night-time digital screen use is significantly associated with increased severity of evaporative dry eye.

I. Introduction

Dry eye disease is a multifactorial disorder of the tear film and ocular surface characterized by tear instability, ocular discomfort, and visual disturbance. Increasing dependence on smartphones, tablets, and laptops has contributed to a growing prevalence of evaporative dry eye among young adults. Night-time screen exposure has emerged as a particularly important risk factor because of prolonged concentration, reduced blink rate, and altered circadian rhythm.

Medical students constitute a high-risk group due to extensive academic screen exposure, online learning, and irregular sleep habits. The present study was undertaken to evaluate the relationship between night-time screen exposure and severity of evaporative dry eye

among medical students.

II. Materials and Methods

A hospital-based cross-sectional observational study was conducted in the Department of Ophthalmology after obtaining Institutional Ethics Committee approval. A total of 100 medical students aged 18–30 years were included.

Inclusion criteria included regular use of digital devices during night-time hours. Participants with contact lens use, ocular surface disease, history of ocular surgery, or systemic diseases affecting tear production were excluded.

All participants underwent detailed ophthalmic evaluation including:

- Visual acuity assessment
- Slit-lamp examination
- Tear Break-Up Time (TBUT)
- Schirmer's test
- Ocular Surface Disease Index (OSDI)
- Meibomian gland assessment

Participants were categorized into three groups based on average night-time screen exposure:

Group A: <2 hours
Group B: 2–4 hours
Group C: >4 hours

Statistical Analysis

Data were analyzed using IBM SPSS version 25. Quantitative variables were expressed as mean \pm standard deviation. Pearson's correlation coefficient and Chi-square test were used. A p-value <0.05 was considered statistically significant.

III. Results

A total of 100 medical students participated in the study, including 42 males and 58 females. The mean age of participants was 22.4 ± 2.1 years.

Students with prolonged screen exposure demonstrated significantly increased dry eye severity.



Table1: Distribution According to Screen Exposure

Screen Exposure Duration	Number of Students
<2hours	24
2-4hours	38
>4hours	38

Table2: Mean OSDI Scores

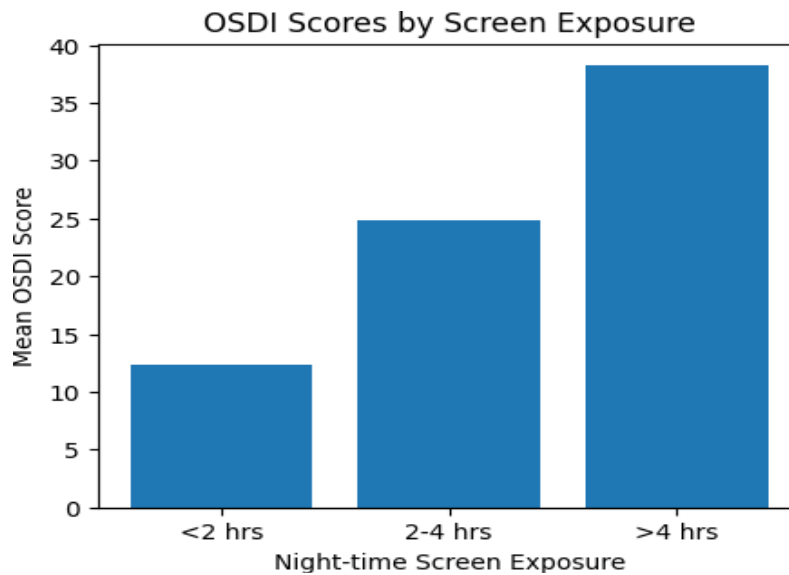
Group	Mean OSDI Score
GroupA	12.4±3.2
GroupB	24.8±4.6
GroupC	38.2±6.1

Table3: Mean TBUT Values

Group	Mean TBUT
GroupA	13.1±2.2sec
GroupB	8.4±1.9sec
GroupC	5.1±1.5sec

Graphs

Figure 1: Mean OSDI scores according to night-time screen exposure.



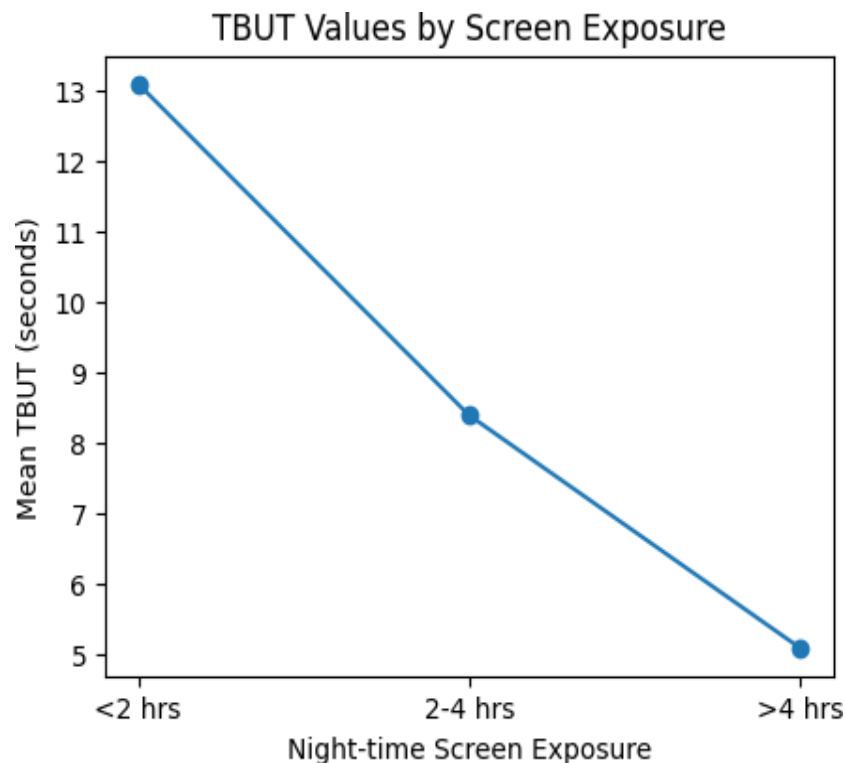


Figure 2: Reduction in TBUT values with increasing night-time screen exposure.

IV. Discussion

The present study demonstrated a significant association between prolonged night-time digital screen exposure and severity of evaporative dry eye among medical students.

Reduced blink rate during screen use contributes to increased tear evaporation and tear film instability.

Students with prolonged exposure after lights off showed significantly lower TBUT values and higher OSDI scores. Similar findings have been reported in previous studies evaluating digital eye strain and computer vision syndrome among young adults.

Medical students are increasingly dependent on smartphones and laptops for academic purposes, making them particularly vulnerable to ocular surface disease. Sleep deprivation associated with late-night screen exposure may further exacerbate tear film dysfunction and ocular discomfort.

Limitations

- Single-center study
- Relatively small sample size
- Dependence on self-reported screen exposure duration
- Cross-sectional design

V. Conclusion

Prolonged night-time digital screen exposure is significantly associated with increased severity of evaporative dry eye among medical students. Early awareness regarding healthy digital practices and routine ophthalmic screening may help reduce the burden of dry eye disease among young adults.

References

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