



ORIGINAL RESEARCH PAPER EVALUATION OF DRY EYE AMONG COMPUTER OPERATORS AT A TERTIARY CARE CENTRE	Ophthalmology KEY WORDS: Dry Eye Disease, Computer Operators, Ocular Surface Disease Index, Schirmer's Test, Tear Break-Up Time
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ABSTRACT	Background: To evaluate the prevalence, severity, and occupational risk factors associated with dry eye among computer operators using Ocular Surface Disease Index (OSDI), Schirmer's test, and Tear Break-Up Time (TBUT). Methods: A cross-sectional study was conducted among 72 computer operators (aged 18–60 years) with ≥6 hours of daily screen exposure for at least six months. Participants completed the OSDI questionnaire and underwent Schirmer's and TBUT testing. Ergonomic and environmental data were collected. Results: Out of 72 participants, 53 (73.6%) had symptoms of dry eye—24 (33.3%) mild, 18 (25.0%) moderate, and 11 (15.3%) severe. Schirmer's test <10 mm was noted in 48 (66.7%), and TBUT <10 sec in 50 (69.4%). Increased daily screen exposure (>8 hrs/day), poor ergonomics, and low humidity (<40%) were significantly associated with higher dry eye severity (p<0.05). Conclusion: Dry eye is highly prevalent among computer operators. Early screening, ergonomic adjustments, blink training, and lubricating drops are recommended to preserve ocular health and efficiency.
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INTRODUCTION Dry Eye Disease (DED) is a multifactorial condition characterized by instability of the tear film, leading to ocular discomfort, visual disturbance, and potential damage to the ocular surface. With increased reliance on digital devices, DED has become a significant occupational health issue. Prolonged visual display terminal (VDT) use reduces blink rate and completeness, causing increased tear evaporation and ocular surface damage.¹⁻² Globally, DED affects nearly 344 million people, and prevalence among digital screen users ranges from 18% to 63%. In India, the prevalence of dry eye among computer users has been reported to range between 25% and 70%, depending on screen time and ergonomic conditions.^{3,6} Despite this, data on dry eye among hospital-based computer operators are limited. This study aims to determine the prevalence and severity of DED among computer operators in a tertiary care hospital and evaluate associated risk factors such as daily screen time, ergonomic practices, and environmental humidity.^{2,4,5} Aim To evaluate the prevalence, severity, and associated occupational risk factors of dry eye disease (DED) among computer operators working in a tertiary care center. Objectives - To estimate the prevalence of dry eye among computer operators using the Ocular Surface Disease Index (OSDI) questionnaire. - To grade the severity of dry eye using Schirmer's test and Tear Break-Up Time (TBUT) measurements. - To identify occupational and environmental risk factors such as daily screen time, frequency of breaks, workstation ergonomics, and ambient humidity associated with dry eye. - To assess the correlation between subjective symptom scores (OSDI) and objective clinical findings (Schirmer's test and TBUT). Materials and Methods Study Design A cross-sectional study conducted over 18 months	(2023–2025) in the Department of Ophthalmology, Sri Siddhartha Medical College and Hospital, Tumkur. Sample 72 computer operators aged 18–60 years, each using computers ≥6 hours/day for ≥6 months. Inclusion Criteria - Age 18–60 year - Daily screen use ≥6 hrs, ≥5 days/week - Consent to participate Exclusion Criteria - Ocular trauma or surgery - Contact lens users - Systemic illness or medications affecting tear function - Other ocular surface disorders Data Collection Participants filled out the Ocular Surface Disease Index (OSDI) questionnaire. Objective evaluation included: - Schirmer's Test I (without anesthesia): to measure tear secretion. Tear Break-Up Time (TBUT): using fluorescein dye and cobalt-blue filter. Workstation parameters (screen height, lighting, chair support) and room humidity were recorded using a digital hygrometer. Statistical Analysis Data were analyzed using SPSS v20. Descriptive statistics were expressed as percentages and mean ± SD. Associations were analyzed using Chi-square and t-tests; p<0.05 was considered statistically significant. RESULTS Table 1: Sex Distribution <table border="1"> <tr> <th>Sex Distribution</th><th>Frequency (%)</th></tr> <tr> <td>Male</td><td>46 (63.9%)</td></tr> <tr> <td>Female</td><td>26 (36.1%)</td></tr> </table>	Sex Distribution	Frequency (%)	Male	46 (63.9%)	Female	26 (36.1%)
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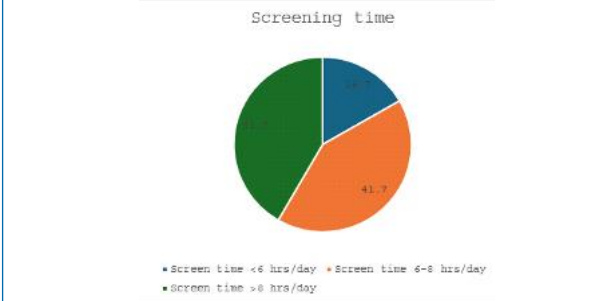
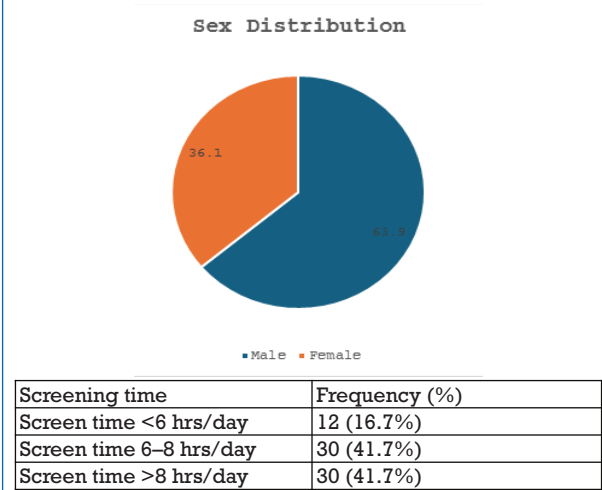


Table 2: Distribution of Dry Eye Severity

Severity Grade	Frequency (%)
Normal (OSDI <13)	19 (26.4%)
Mild (13–22)	24 (33.3%)
Moderate (23–32)	18 (25.0%)
Severe (≥33)	11 (15.3%)

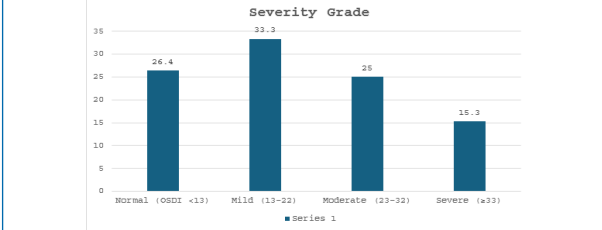


Table 3:

Test	Abnormal
Schirmer's test <10 mm	48 (66.7%)
TBUT <10 sec	50 (69.4%)
Both Schirmer's + TBUT abnormal	42 (58.3%)

Table 4: Grading of Dry Eye Based on Schirmer's Test

Schirmer's Test Value (mm)	Severity Grade	Number of Patients (n)	Percentage (%)
>10 mm	Normal	24	33.3%
8–10 mm	Mild Dry Eye	14	19.4%
5–7 mm	Moderate Dry Eye	18	25.0%
<5 mm	Severe Dry Eye	16	22.2%
Total		72	100%

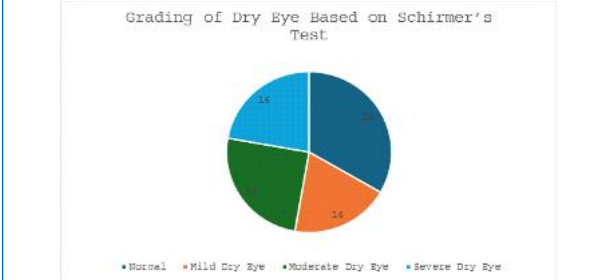
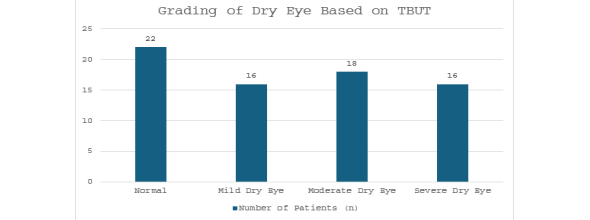


Table 5: Grading of Dry Eye Based on TBUT

TBUT (seconds)	Severity Grade	Number of Patients (n)	Percentage (%)
>10 sec	Normal	22	30.6%
7–10 sec	Mild Dry Eye	16	22.2%
5–6 sec	Moderate Dry Eye	18	25.0%
<5 sec	Severe Dry Eye	16	22.2%
Total		72	100%



DISCUSSION

This study revealed a 73.6% prevalence of dry eye among computer operators, indicating a significant occupational burden. The findings align with Chaitra et al. (2022) who reported 68% prevalence among tertiary hospital staff, and Patil et al. (2016) who observed 25% prevalence with increasing duration of screen exposure. A clear positive correlation was found between OSDI scores and both Schirmer's and TBUT results, confirming that subjective symptoms correspond with objective findings. Prolonged screen use, reduced blink rate, and poor ergonomics are established contributors to tear film instability. Similar results were noted by Shah and Jani (2015) and Uchino et al. (2014) who emphasized environmental and behavioral factors in DED pathogenesis. Interventions such as improving workstation ergonomics, increasing blink awareness, ensuring adequate ambient humidity, and regular use of lubricating eye drops can effectively reduce symptoms and improve ocular comfort.

CONCLUSION

Dry eye is a prevalent occupational condition among computer operators, primarily influenced by excessive screen time and improper workstation setup.

Routine screening, ergonomic improvements, blink training, and preventive eye care should be integrated into workplace health programs.

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