

Assessment of Association of Screen Time, Quality of Sleep and Dry Eye

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Abstract

Background: Amongst computer workers, the occurrence of computer vision syndrome is greater than fifty percent. The proliferation of websites as well as social networks has persuaded young people to spend more time in front of computers or digital devices. The present study was conducted to assess association of screen time, quality of sleep and dry eye.

Materials & Methods: 140 subjects of both genders were selected. A pre-structured questionnaire was used to gather data regarding the occurrence of dry eye as well as sleep quality. A ten-item Mini Sleep Questionnaire was used to assess sleep quality as well as standard patient evaluation of eye dryness dry eye scale had been used to evaluate the occurrence of dry eye.

Results: Out of 140 subjects, males were 55 and females were 85. There was a strong link between dry eye with everyday screen time spent as well as sleep quality.

Conclusion: Dry eye as well as sleep quality are important global health conditions, and combined with longer screen time, might pose a challenge in the present era.

1. Introduction

A multivariate, painful inflammatory illness of the tear film called as dry eye disease, otherwise referred to as keratoconjunctivitis sicca as well as keratitis sicca, is brought about by inadequate lubrication through the eyes' tears.¹ It is believed to be caused by the tear film's lack of homeostasis, that causes numerous visual ailments because of greater evaporation or reduced production of the tear film, that is located on the exterior most corneal surface.² It is believed that irregularities in the eyelids, a lack of tear components, or insufficient blinking as a

result of extended time spent in front of a screen are to blame for the disruption of the tear film's homeostasis. This might also be brought on by autoimmune diseases, allergies, ocular operations, or systemic ailments.³

Amongst computer visitors, the frequency of computer vision disorder is over fifty percent. The growth of websites and social networks has persuaded young people to spend more time in front of computers or digital gadgets.⁴ Since the previous ten years, there have been many online venues for learning and pleasure, including games as

well as films. As a result, youth screen duration has increased steadily across several nations.⁵ Circadian rhythm abnormalities are caused by electromagnetic waves as well as blue light from computers & laptops. Melatonin suppression brought on by blue light promotes drowsiness. Digital media consumption causes dry eyes because it causes fewer and less complete blinks, which causes a fragile tear film.⁶ The goal of the current research was to determine whether screen duration, sleep quality, as well as dry eye were related.

2. Materials & Methods

The current research consisted of 140 subjects of both males and females.

Names, ages, genders, and other information were recorded. We gathered data on the occurrence of dry eyes and the quality of sleep using a prestructured questionnaire. To assess the sleep patterns as well as the occurrence of dry eyes, a 10-item Mini Sleep Questionnaire as well as the SLEEP dry eye scale were employed. Participants were split into 4 classes for the sleep-wake domain: good sleep-wake quality (10–24 points), mild sleep-wake issues (25–27 points), moderate sleep-wake struggles (28–30 points), and severe sleep-wake problems (>30 points). The subjects were sorted into 3 groups for the dry eye domain depending on the intensity and frequency of the items: 0–5 (no symptoms), 6–14 (mild to moderate symptoms), and 15–28 (severe symptoms).

3. Results

Table I Distribution of patients

Total- 140		
Gender	Male	Female
Number	55	85

Table I shows that out of 140 subjects, males were 55 and females were 85.

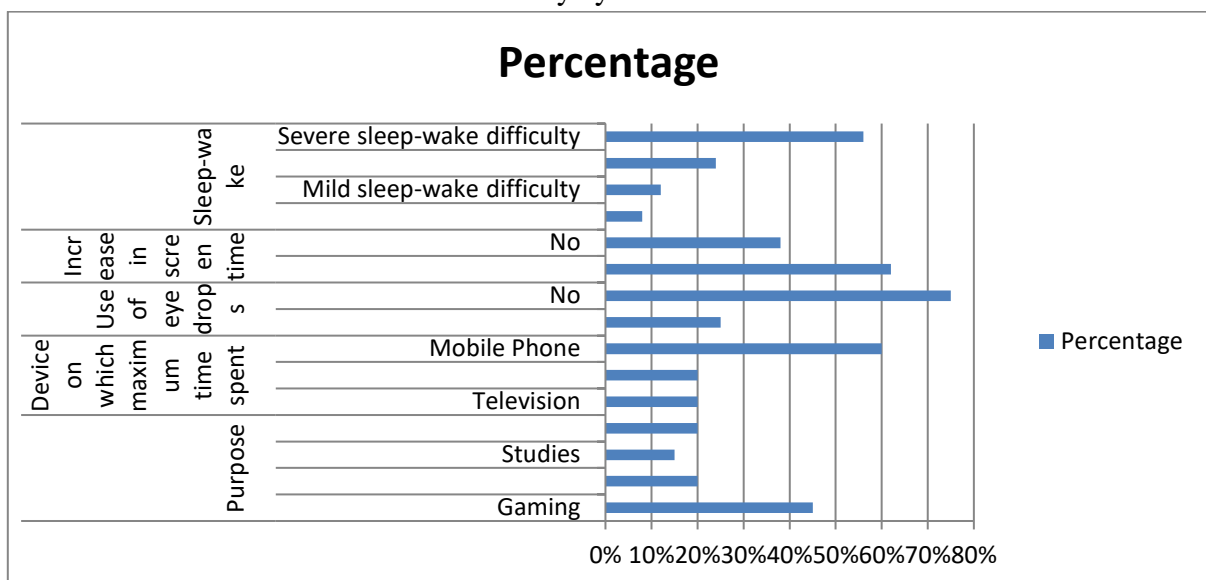
Table II Responses for general domain and comparison of responses between sleep-wake domain and dry eyes domain

Statements	Response	Percentage	Sleep-Wake Domain P	Dry Eyes Domain P
Purpose	Gaming	45%	0.05	0.02
	Movies	20%		
	Studies	15%		
	Social media	20%		
Device on which maximum time spent	Television	20%	0.02	0.03
	Laptop	20%		
	Mobile Phone	60%		
Use of eye drops	Yes	25%	0.04	0.01
	No	75%		
Increase in	Yes	62%	0.05	0.02

screen time	No	38%		
Sleep-wake	Good sleep-wake quality	8%	0.03	0.04
	Mild sleep-wake difficulty	12%		
	Moderate sleep-wake difficulty	24%		
	Severe sleep-wake difficulty	56%		

Table II, graph I shows that there was a significant association between dry eye with the daily screen time spent and quality of sleep ($P < 0.05$).

Graph I Responses for general domain and comparison of responses between sleep-wake domain and dry eyes domain



4. Discussion

Two categories of computer-related complaints have been established: those affiliated to accommodation as well as those related to dry eyes.⁷⁻⁸ Since dry eye could be produced by a variety of different circumstances, it may be challenging to pinpoint its aetiology. Intrinsic risk indicators for DED comprise factors like growing older, being a woman, having eye conditions, and having some underlying autoimmune as well as systemic illnesses.⁹⁻¹⁰

Contact lens utilization, environmental variables, topical or systemic drugs, a lack of good hygiene habits for the eyelids as well as eyelashes, fashions in eye aesthetics, as well as the components and uses of eye cosmetic products can all be extrinsic risk variables for DED.¹¹⁻¹² The goal of the current research was to determine whether screen duration, sleep quality, as well as dry eye were related. Among one hundred and forty subjects, fifty five were men whereas eighty five were women. In their research, Gupta et al.¹³

found a strong correlation between college-bound females' daily screen use as well as quality of sleep & dry eye symptoms. 2 latent categories were chosen by latent class analysis adopting Bayesian information criteria. The majority of the community, belonged to class 2, and had trouble in sleeping and waking up. Subjects of the second class were between the ages of eighteen and twenty one years. They belonged to the Humanities stream; their parents had both completed college; just the father worked; they were from nuclear families; they had one sibling; and they came from urban areas. They noted spending over six hours per day in front of a screen, with the large percentage of them utilising mobile phones and an increment in screen period throughout COVID19.

A strong correlation existed among everyday screen exposure as well as sleep quality & dry eyes. In their research, Alnahdi et al.¹⁴ recruited three hundred and twenty nine child subjects being between the ages of twelve and eighteen years. Itchy eyes as well as reduced vision had been often mentioned complaints. Environmental conditions have an impact on the onset of DED symptoms; for example, a few individuals expressed uneasiness in windy conditions, whereas 15.8 percent expressed this in environments having air conditioners. Two hundred and fifty subjects exhibited DED according to the OSDI diagnostic criteria. In addition, one hundred and forty five subjects exhibited severe DED, forty four experienced mild DED, sixty two showed moderate DED, whereas forty four had no DED at all. In contrast to those who were subjected to shorter durations of time, we discovered that extended contact to mobile devices for 2 to 3

hours or 4 hours or longer was linked to a greater incidence of DED. It was more probable to occur in advanced age groups. Individuals having a background of eyeglass prescriptions as well as those who experienced dry eyes when using electrical gadgets were individually linked to DED.

Lee et al.¹⁶ showed that sleep deprivation enhanced the tear osmolarity, decreased the tear film breakup time, as well as decreased the tear fluids, all of which individually provoked or worsened the ocular surface ailment. A large research employing crowdsourcing information discovered a link between more than eight hours of screen usages per day as well as symptomatic dry eye in contrast to four hours per day. Sleep disorders frequently involve autonomic disturbance, which impairs the parasympathetic fibres inside the lacrimal glands as well as reduces tear production.

The study's limitation is its tiny sample size.

5. Conclusion

Authors found that dry eye as well as quality of sleep are important global health conditions, as well as combined with longer screen time, might pose a challenge in present era.

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