International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 1, January 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.1.2025.149

ORIGINAL RESEARCH

Observational Study on the Association Between Screen Time and Digital Eye Strain Among Young Adults

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Received: 29 November, 2024 Accepted: 23 December, 2024 Published: 19 January, 2025

ABSTRACT

Background: Across all age groups and professional fields, the use of digital devices has become an integral part of everyday life in recent years. The present study was conducted to assess association between screen time and digital eye strain among young adults. **Materials & Methods:** 240 young adults of both genders were selected for the study. DES was measured using a 10-item scale, and the sum of the 10 dichotomised scores was used as the DES total score. **Results:** Out of 240 subjects, 110 were males and 130 were females. Smartphone usage (min/d)0-60 was seen in 50, 61-120 in 70, 121-180 in 60 and 181-240 in 80 subjects. The mean screen time score was 2.2, 2.1, 2.4 and 2.7 respectively. The difference was significant (P< 0.05). **Conclusion:** It was found thatdigital eye strain was highest among those in which screen time was more.

Keywords: Digital Eye Strain, Screen Time, Smartphone

INTRODUCTION

Across all age groups and professional fields, the use of digital devices has become an integral part of everyday life in recent years.[1] In children, screen time refers to the amount of time spent on activities involving exposure to digital screens (screen-based activities), such as gadgets/smartphones, laptops, computers, or televisions, either actively (e.g., online learning, communication, games) or passively (reading). Screen-based activity refers to any activities that children engage in involving screen-based media (such as television, computers, video games, and gadgets).[2]

As defined by the American Optometric Association, the term “digital eye strain” (DES) refers to a set of vision and ocular disorders caused by extended use of digital devices.[3] DES can affect anyone who spends a substantial amount of time focused on digital screens, whether for business or enjoyment, due to the rising usage of digital screens in everyday technology. The increased screen-based activity time linearly contributes to the appearance of various symptoms of eye health problems.[4]Previous research has reported that the most common DES symptoms reported are dry eyes, its related symptoms, such as tearing, and symptoms related to accommodative stress, such as eyestrain, headache, as well as neck or shoulder pain.[5]The human eye is generally sensitive to 1 part of the light wave spectrum, namely visible light. Previous studies have shown that prolonged exposure to blue light from digital devices can cause macular degeneration, which is an important part of the eye's retina that, if damaged, can lead to visual impairment.[6,7]The present study was conducted to assess association between screen time and digital eye strain among young adults.

MATERIALS & METHODS

The study was carried out on 240 young adults of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. DES was measured using a 10-item scale, and the sum of the 10 dichotomised scores was used as the DES total score. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

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RESULTS

Table I Distribution of subjects

Total- 240		
Gender	**Male**	**Female**
Number	110	130

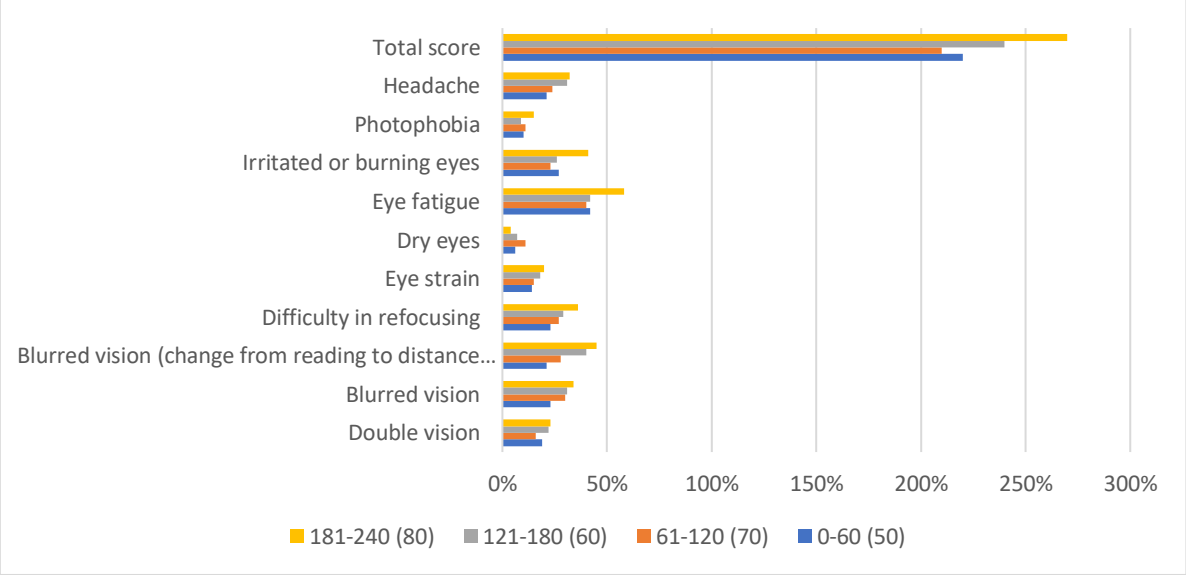
Table I shows that out of 240 subjects, 110 were males and 130 were females.

Table II Assessment of parameters

Smartphone usage (min/d)	Double vision	Blurred vision	Blurred vision (change from reading to distance viewing)	Difficulty in refocusing	Eye strain	Dry eyes	Eye fatigue	Irritated or burning eyes	Photophobia	Headache	Total score
0-60 (50)	19%	23%	21%	23%	14%	6%	42%	27%	10%	21%	2.2
61-120 (70)	16%	30%	28%	27%	15%	11 %	40%	23%	11%	24%	2.1
121-180 (60)	22%	31%	40%	29%	18%	7%	42%	26%	9%	31%	2.4
181-240 (80)	23%	34%	45%	36%	20%	4%	58%	41%	15%	32%	2.7
P value	0.05	0.04	0.01	0.03	0.90	0.01	0.04	0.05	0.02	0.03	0.01

Table II, graph I shows that smartphone usage (min/d)0-60 was seen in 50, 61-120 in 70, 121-180 in 60 and 181-240 in 80 subjects. The mean screen time score was 2.2, 2.1, 2.4 and 2.7 respectively. The difference was significant (P< 0.05).

Graph IAssessment of parameters



DISCUSSION

Long-term use of mobile devices can have a negative impact on health, especially the visual system of the eye.[8,9] Even the worst cases of exposure to electromagnetic radiation from a phone can result in eye tumors. Parents need to monitor how much time their children spend watching television in addition to how much time they spend on handphones.[10] One of the losses that have a negative impact due to television visibility is less than 3 times the inch diameter of the television size.[11] Regrettably, some parents neglect to consider the recommended safe

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viewing distance for their children in regards to television watching. In previous studies, eyestrain began to occur within 5 minutes of watching television and was quickly followed by a large increase in blink rate and a decrease in fixation.[12]The present study was conducted to assess association between screen time and digital eye strain among young adults.

We found that out of 240 subjects, 110 were males and 130 were females.WartiningsihMet al[13]determined the prediction of the relationship and influence between Screen-Based Activity (SBA) and the incidence of Digital Eye Syndrome (DES) in children aged 9-12 years. There were 62 respondents in the research samples, or the same number as the total population. Based on the results of the analysis, obtained t-count (23.821) is greater than the t-table (1.96), meaning that there is a relationship and influence between SBA variables on DES. The correlation coefficient of SBA to DES is positive 0.818 which means the higher the Screen Based Activity, the higher the risk of Digital Eye Strain. The use of handphone (X2) is an indicator of SBA with the highest correlation strength of 88.1%

We found that smartphone usage (min/d)0-60 was seen in 50, 61-120 in 70, 121-180 in 60 and 181-240 in 80 subjects. The mean screen time score was 2.2, 2.1, 2.4 and 2.7 respectively. Chu et al[14]investigated the association between time spent on smartphones and digital eye strain (DES) among school-aged children. Of a total of 1,508 students (748 males, 49.6%) from 8 to 14 years old (mean age=10.91 years, SD=2.01) who provided valid data on DES, the 1,298 (86%) who completed the DES questionnaire at 1-year follow-up were included in the analysis. DES was measured using a 10-item scale, and the sum of the 10 dichotomised scores was used as the DES total score. The most commonly reported symptoms were eye fatigue (n=804, 53.3%), blurred vision (changing from reading to distance viewing) (n=586, 38.9%), and irritated or burning eyes (n=516, 34.2%). The DES total scores at baseline and 1-year follow-up were 2.91 (SD=2.90) and 3.20 (SD=3.19), respectively. Linear regression controlling for demographic and socio-economic confounders showed that participants with baseline smartphone usage of 241+min/d had a significantly higher baseline total DES score than those with baseline smartphone usage of 0–60 min/d (2.44 vs 3.21, P<0.01) participants with baseline smartphone usage of 181–240 min/d had a significantly higher 1-year follow-up total DES score than those with baseline smartphone usage of 0–60 min/d (2.80 vs 3.50, P=0.003).

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that digital eye strain was highest among those in which screen time was more.

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