ORIGINAL RESEARCH PAPER

Opthalmology

OCULAR MANIFESTATIONS OF PROLONGED SCREEN TIME IN PAEDIATRIC AGE GROUP: A QUESTIONNAIRE BASED STUDY

KEY WORDS: Screen Time, Computer Vision Syndrome, Paediatric Age Group

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ABSTRACT

Today's digital era has gifted the modern generation with a variety of smart electronic audiovisual gadgets which has eventually reached children and is keeping them busy for a significant part of the day. This cross sectional questionnaire based study has been conducted on 237 subjects below 18 years of age by obtaining data from their guardians to find out the ocular manifestations in them to establish a correlation between screening time and occurrence of symptoms and a directly proportional trend has been observed between the two parameters

INTRODUCTION:

Today's era is the "Digital Era", with a myriad of "Smart" electronic audiovisual gadgets ranging from laptops, tablets, smart phones, desktops and what not! Due to increased availability and affordability, these delightful devices have reached the households of the common people and keeping them busy for a significant period of the day in forms of work, entertainment as well as educational content. Children in particular are seen to be quite fond of them and are often found glued to them to a point of even addiction. This has led to a group of maladies that are termed as Computer Vision Syndrome. This study aims to find out the impact of this rise in use of these devices for today's digital generation via a questionnaire based study in a tertiary care centre in Barak Valley, Assam, India

Aim:

To establish a correlation between prolonged screen time and ocular manifestations in paediatric age group.

MATERIALS AND METHODS

All patients under 18 years of age attending ophthalmology outpatient department between 1st August 2023 to 30th September 2023 were chosen as the study population for this descriptive, cross sectional study. A pretested semi-structured questionnaire (Image 1) was used for obtaining data after obtaining informed consent from the guardians and assent from the subjects. The questionnaire was filled by the guardians.

All children attending Ophthalmology outpatient department were included by purposive sampling while excluding subjects with non-consenting guardians, congenital and/or severe illnesses.

Image 1: Questionnaire used for the study

RESULTS:

237 subjects fulfilling the inclusion and exclusion criteria were recruited, and their data was analyzed and graphically presented.

Demographics:

126 subjects were males constituting 53.16% of the population.

The population was divided into 4 age groups i.e.
Preschoolers (<5 years): 33 (13.9%) subjects
Primary school age (5-10 years): 61 (25.74%) subjects
High school age (10-15 years): 76 (32.07%) subjects
Higher secondary school age (15-18 years): 67 (28.27%)

Use of digital devices:

The users of various digital devices were sorted to find the following outcome

Smartphone: 206 (87.29%) users
Television: 176 (74.26%) users
Tablet: 67 (28.39%) users
Laptop: 135 (56.96%) users
Desktop: 96 (40.51%) users
Smart watch: 26 (10.97%) users

It was further found that 146 subjects used multiple devices forming 62.03% of the study population

Exposure to Screen Time:

The exposure to screen time was divided into 4 groups and classified as the following
Group 1 (<4 hours): 56 (23.63%) children
Group 2 (4 -6 hours): 109 (45.99%) children
Group 3 (6 -8 hours): 50 (21.10%) children
Group 4 (>8 hours): 22 (9.28%) children

Ocular Manifestations:

162 (68.35%) subjects manifested with some type of ocular symptoms. Among the symptomatic population, 71 (29.96%) had headache, 54 (22.7%) had frequent blinking of eyes, 48 (20.25%) had watering, 37 (30.80%) had itching, 26 (10.97%) had diminution of distant vision, 16 (6.75%) had occasional eye deviation, 11 (4.4%) had convergent squint and 3 (1.27%) had diminution of near vision.

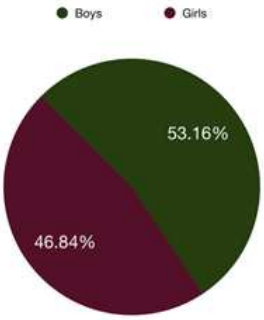

Fig. 1a Distribution of Study Population according to Gender

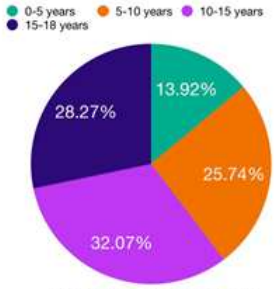

Fig. 1b Age Distribution of Study Population

Graph 1: Demographic Data of the Study Population

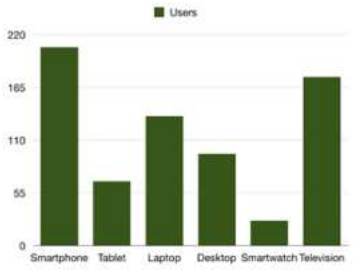

Fig. 2a Distribution of Study Population according to Use of Digital Devices

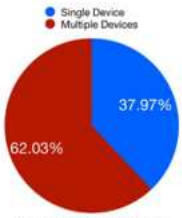

Fig. 2b Distribution of Study Population according to use of number of devices

Graph 2: Data of Usage of Digital Devices by the Study Population

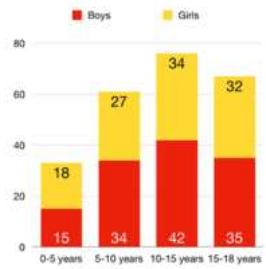

Fig. 3 Age and Gender Distribution of Study Population

Graph 3: Age and Gender Distribution of Study Population

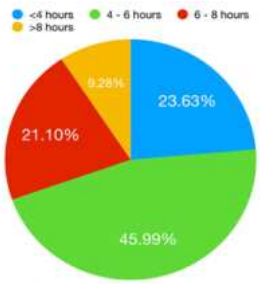

Fig. 4 Distribution of Study Population according to screen time

Graph 4: Screen Exposure Time of the Study Population

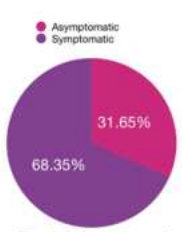

Fig. 5a Distribution of Appearance of Symptoms in Study Population

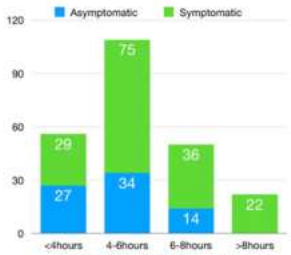

Fig. 5b Distribution of Hours of Exposure versus ocular symptoms in Study Population

Graph 5: Data on Appearance of Symptoms and Correlation with Screen Exposure Time in the Study Population

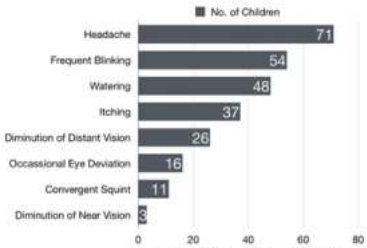

Fig. 6 Distribution of Ocular Symptoms in Study Population

Graph 6: Data on the Distribution of Symptoms in the Study Population

DISCUSSION:

The study has brought the following points to light

- The occurrences of ocular manifestations have a slight female preponderance (71.17% of females were symptomatic compared to 65.8% of males), which is in accordance with the study by Shima et al[1].
- The commonest gadget is Smartphone which is used by 87.29% of the study population which is also supported in studies by Amit Mohan et al(DESK-1)[2] and Richa Agarwal et al.[3]
- More than one digital device is used by 147 subjects which forms 62.03% of the study population which is also substantiates the findings in the DESK-1 study by Amit Mohan et al[2] as well as in the study by Ugam Usgaonkar et al.[4]
- Of the 162 symptomatic subjects, the maximum have a screen time of 4 to 6 hours.
- All of the 22 subjects with screen time more than 8 hours were found to be symptomatic
- Screen Time has been observed to have a directly proportional trend with ocular manifestations, confirming the detrimental effects of prolonged screen time beyond 4 hours as pointed out in the DESK -2 study by Amit Mohan et al.[5]
- The most common manifestation is headache, followed by frequent blinking of eyes, watering, itching, diminution of distant vision, occasional eye deviation, convergent squint, and rarest is diminution of near vision. This however contradicts the findings of Richa Talwar et al[6] who state it to be redness while Amy L Shepard et al[7] and Richa Agarwal et al[3] stating it to be eye strain.
- Thus, reduction of Screen Time for paediatric age group might prove beneficial for their ocular health which is supported by the study of Jenny Radesky et al.[8]

Recommendations:

In light of the aforementioned findings, the following recommendations have been formulated

- Reduction of total Screen Time
- Maintenance of proper viewing distance
- Adjustment of font, screen brightness, and contrast
- Observation of the 20-20-20 rule i.e. After viewing screen for 20 mins, one should view at a distance of more than 20 feet for a period of 20 seconds and blink 20 times before resuming work on screen
- Consumption of a healthy diet and proper sleep cycle
- Regular eye checkups

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