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Prevalence Of Ocular Morbidities And Screen Time Among Primary School Children Of Rural Area: Cross Sectional Study.

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ABSTRACT

Ocular morbidity, which often begins in childhood, can cause severe eye disabilities and affect development, academic performance, social and employment opportunities. National monitoring of ocular morbidity detection, early treatment, and addressing medical concerns is needed to identify areas of need and determine the most cost-effective screening and treatment methods. Devices like smartphones and video games increase the risk of ocular abnormalities. Children and parents should gain knowledge about early detection of ocular morbidities, eye hygiene and defect repairs. The present study was aimed to know the prevalence of ocular disease among primary school children aged 6-11 years and its association with screen time. Under The Department of Community Health conducted a population-based cross-sectional study in the rural field practice areas of the Government Medical College, which included 300 children aged 5 to 11 attending primary schools. The subjects were questioned using a well-designed questionnaire. The responses were collected and evaluated by a qualified medical professional, and the results were recorded on the study's proforma. After confirming the questionnaire's accuracy, the data were entered into a Microsoft Excel® Spreadsheet and SPSS was used for statistical analysis. The prevalence of ocular morbidities associated with screen time among elementary school students was determined using the Chi-Square test. Less than 0.05 P value was considered statistically significant. The study included 300 participants aged between 6 and 11 years, with a mean age of 8.3 ±1.67 years. There were 49.3% (n=148) girls and 50.7% (n=152) boys. The primary objective of our study was to evaluate screen-related ocular morbidities in elementary school students using the Chi-Square test. 53.2% of 139 children who used digital devices for 2-4 hours (time code 1) and 67.5% of 77 children who used digital devices for 4-6 hours (time code 2) reported symptoms. The Chi-square test yielded a significant p value (p=.041) as a result. In our study, the Chi-squared test revealed no association between eyeglass use and ocular morbidity symptoms. (p=.221). School children between the ages of 6 and 11 were found to have a high prevalence of 48.7% of ocular morbidity, with a positive association to exposure to digital display devices. Therefore, early diagnosis and treatment of visual impairment are necessary to prevent damage to children's vision and academic performance.

Keywords Ocular Morbidity, screen time, digital display devices, school children

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INTRODUCTION

Childhood ocular morbidity is defined as "any eye disease or condition requiring ophthalmic care and therapy that, if left untreated, frequently progresses to a severe and sight-threatening disease." Much ocular morbidity originates in childhood and, if undetected and improperly treated, can cause severe eye disabilities, besides affecting development, academic performances, social and employment opportunities; consequently, ocular morbidity is a significant public health concern therefore Vision 2020: The Right to Sight has prioritized the repair of refractive problems as one of its action areas.

270,000 of the approximately 1.4 million blind children in the world are estimated to reside in India. Population-based studies have estimated the prevalence of blindness in children aged 5 to 15 years in rural and urban regions to be 1.25/1000 and 0.53/1000, respectively. It is difficult to establish the prevalence of childhood blindness. Childhood blindness is the second leading cause of blind-person years worldwide, after cataract. Uncorrected refractive errors are a major source of preventable vision impairment, particularly in underdeveloped nations. Children's ocular morbidity is mostly attributable to factors other than blindness and refractive errors, such as amblyopia, strabismus, vitamin A deficiency, cataract, corneal opacity, lid disorders, and retinal disease. National monitoring of measures to detect uncorrected refractive errors, provision of refractive treatments, and addressing health requirements is necessary to identify areas in need and evaluate the most cost-effective screening and treatment methods [1, 2].

Computers and other digital display devices are now indispensable to daily life. With the rise in popularity of laptops, tablets, smart phones, and e-book readers, the usage of digital devices is no longer restricted to desktop computers. Children as young as two years old are given touch screen devices such as i-Pads to play and study with in this technological age [3].

Social importance is given to preventing vision impairment and preserving eye health from birth to adulthood. The increased usage of mobile phones and video games poses a danger for ocular abnormalities. For the early correction of poor vision in school-aged children, it is advised that vision screenings occur at the time of school entry and that children undergo frequent eye exams. Teachers should be taught in vision screening for children with visual impairments. The importance of eye hygiene and early repair of refractive defects should be communicated to children and their parents [4].

With this context in mind, the purpose of the present study was to establish the prevalence of ocular disease among primary school children aged 6-11 years and the effect of digital display devices on school-aged children.

MATERIALS AND METHODS

The Department of Community Health conducted a population-based cross-sectional study in Government Medical College rural field practice areas. Before starting the study, the institutional ethics committee of a government medical college Maharashtra.

Large multistage population-based studies found 1.3% to 6.54% ocular morbidity, while school-based research found 13%–44.7% [5].

We assumed 20% prevalence, between the two estimates from distinct study designs. N = 4pq/d2 (where p is the prevalence from previous study, q is 100 – p, and d is the acceptable error (25% of p)) yielded 256 samples for a power of 80% and alpha of 0.05. Considering dropouts, we sampled 300 children. From prior population enumeration, the "probability proportionate to size" model was used to choose 300 children aged 6-11 years from 18 Strata.

The study included all 6-11 year-olds who lived at this residence for more than 6 months, were willing to participate, and had parental approval.

The primary objective was to determine the prevalence of ocular morbidities and its correlation with screen time among children attending primary school in Nasik.

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The subjects were interviewed on the basis of a pre tested pre-designed questionnaire. Response collection and preliminary evaluation were performed by a competent medical practitioner, and the results were recorded on the study proforma, the data were loaded into a Microsoft Excel® Spreadsheet for statistical analysis. We used the Chi squared test to determine the associations because the data to be analyzed is based on probability proportional sampling, a type of random sampling, and the variables in the question are categorical variables. Statistical significance was defined as a value less than 0.05**.** the prevalence of ocular morbidities associated with screen time among elementary school students was assessed.

RESULTS

The data was recorded into Microsoft Excel spreadsheet to convey summarized data, tables were employed. The data was analyzed using SPSS (2.1.0 versions).

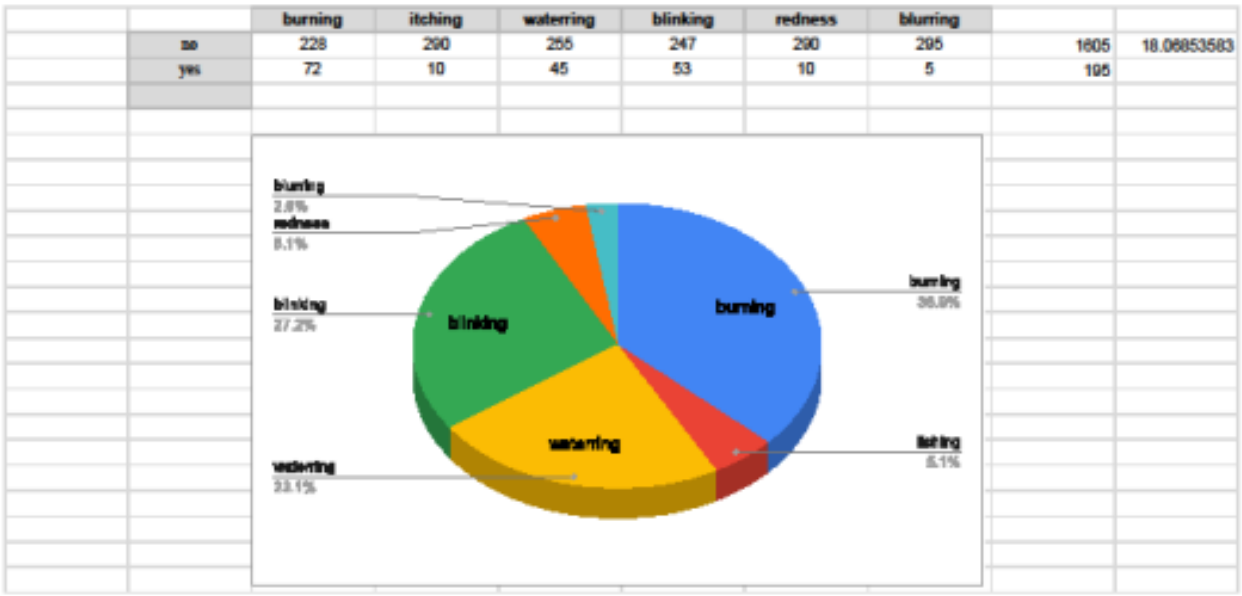
The ages of the 300 participants in our study ranged from 6 to 11 years, and the majority of children (71 percent) were younger than 10 years old. This study included 50.7% (n=152) boys and 49.3% (n=148) girls, representing a nearly equal distribution of males and females.

90.3% of children belonged to families with a low socioeconomic status, but the majority of their parents had at least a primary school education and were employed (83% of mothers and 84.3% of fathers were employed).

Our study's primary objective was to assess association of screen time and ocular morbidities screen-related ocular morbidities in elementary school students using the Chi-Square test. 53.2 % of 139 children who viewed any digital device for 2-4 hours (time code 1) had symptoms, while 67.5 % of 77 children from 4-6 hours (time code 2) had symptoms. Consequently, the Chi-square test revealed a significant p value (p=.041).

Our study subjects had an overall prevalence of ocular morbidity of 48.7%, with eye burning being the most frequently reported symptom, occurring in 24% (n=72 children). Other symptoms recorded in decreasing order were eye blinking (17.7%, n=53), eye watering (15%, n=45), eye itching (3.3%, n=10), eye redness (3.3%, n=10), and eyesight blurring (1.7%, n=5).

Ocular morbidity was linked to a history of spectacles use. Despite the fact that nearly 235 (78 percent) of the children in our sample did not wear spectacles, 110 of them had a history of symptoms associated with ocular morbidities. Similarly, 36 of the remaining 65 children who wore glasses had symptoms. The Chi squared test revealed no significant association between ocular morbidity symptoms and history of spectacle use in our study. (p=.221).



DISCUSSION

Childhood ocular morbidity consists of numerous eye illnesses that negatively impact cognitive development, academic performance, and quality of life. Similar to the findings of other Indian studies, our findings indicate that ocular disease is a significant and serious public health issue that requires an appropriate medical system response and effective primary healthcare initiatives targeting children in order to reduce visual impairment among the younger population.

A study conducted in Bhubaneswar, Odisha, uncovered significant ocular morbidity in children from 6-17 years. Most victims were between 12 and 17 years old. However, there is a paucity of early detection and treatment of ocular morbidity in children under 20. 71% of the 300 participants in our study were under 10 years old. Since data on ocular morbidity in children attending primary school in India are scarce and regional, we considered the age group from 6-11years.

This study included 50.7% (n=152) boys and 49.3% (n=148) girls signifying a near equal male and female distribution. Similar to this, distribution, 53.97% of girls had ocular morbidity, while 45.92% of boys did in the study conducted by Rao et al [6].

We employed Probability proportional sampling, also known as probability proportional to size (PPS) sampling, as in the study by Mahesh et al. It has the potential to reduce sample variance and thus enhance precision for estimating results. Because the data to be studied is based on probability proportional sampling, a sort of random sampling, and the variables in the question are categorical variables, we utilized the Chi squared test to identify the relationships. A value less than 0.05 was considered statistically significant [5, 7].

The overall prevalence of ocular morbidity in our study participants was 48.7%. This is similar to the research by Chaturvedi et al, in which 40% of the 679 primary school children from Delhi's developed southern and impoverished eastern areas had ocular illness. The age range was 5-15 years, and both sexes were nearly equally represented. Gupta et al. documented similar findings in their study aimed at estimating the prevalence of ocular morbidity among school-aged children aged 6 to 16 years. 1561 students from elementary to secondary school were assessed, and the overall prevalence of ocular morbidity was 31.6% [8, 9].

Computers and other digital display devices are now essential. Digital gadgets are now used on computers, tablets, smartphones, and e-book readers. In this technological age, two-year-olds play and learn with iPads. Screen usage is linked to insufficient sleep, physiological stress, mind wandering, ADHD-related behaviour, non-adaptive/negative thinking patterns, decreased life satisfaction, and significant health problems in adulthood in children and adolescents [3, 10].

The Chi-Square test, which demonstrated a substantial relationship between screen-related ocular morbidities and elementary school students, was the primary purpose of our study. (p=.041). Additionally, a higher occurrence of symptoms was seen in the group which viewed any digital device for a longer duration of 4-6 hrs. (67.5%) in comparison to the group which had a lower viewing time (53.2%). Similar results were observed in a study by Reddy and Singh, in which a total of 1100 school students who had a history of digital screen equipment use were screened and it was discovered that 25.6% of the children had visual impairment and 28.6% had ocular morbidities, with exposure time to digital display devices showing a positive correlation [3].

In our sample, 90.3% of children were from low-income homes, yet the majority of their parents had at least a primary school education and was employed (83% of moms and 84.3% of fathers). Multiple researches on children and adults have demonstrated a correlation between a higher frequency of ocular illness and an increase in illiteracy and low socioeconomic position. Consequently, this may account for a higher incidence in our study [11, 12].

Internationally, Africa, Finland, Chile, and Nepal had lower frequencies of eye defects among children aged 5 to 15 when compared to current study. It is possible that these inequalities are the result of geographical variances in the occurrence of ocular abnormalities, as well as differences in lifestyles, medical care, and study diagnostic criteria [13].

Our study participants showed an overall prevalence of ocular morbidity of 48.7%, with eye burning being the most often reported symptom (24%; n=72 children). Other complaints included eye blinking (17.7%, n=53), eye watering (15.0%, n=45), eye itching (3.3%, n=10), eye redness (3.3%, n=10), and eyesight blurring (1.7%, n=5). Extensive cross-sectional research has demonstrated that the duration of digital screen use is connected with a higher likelihood of severe symptoms and clinical diagnosis of dry eye disease. The duration of smartphone use was also observed to be longer among school-aged children with dry eye illness compared to those without dry eye disease. A widely accepted idea regarding the relationship between digital screen use and dry eye illness is that digital screen use modifies the dynamics of blinking, resulting in ocular dryness. Depending on the individual, dry eye symptoms may include ocular irritation, pain, weariness, and visual abnormalities such as fluctuating and blurred vision. It is believed that the discomfort and pain caused by dry eyes has a detrimental effect on quality of life and may damage the mental health and work productivity of digital screen users [14].

In our study, the Chi-square test demonstrated no significant correlation between ocular morbidity symptoms and spectacle use history. (p=.221).

Bener et al. examined the effects of excessive internet use and television viewing on poor vision in a study that included 2,586 youngsters from Arab countries. The prevalence of poor vision was 15.2% overall. In the 6-10 age range, the prevalence of poor eyesight was significantly greater (17.1%; P=0.05). The prevalence of low eyesight was higher among television watchers (17.2%) than among occasional viewers (14.0%). The percentage of children who wear glasses was greater among frequent Internet and television users (21.3%). Thus, their findings contradicted those findings of our study [15].

This to summarize, the purpose of this study was to estimate the prevalence of ocular morbidity and the influence of digital display devices among school-aged children. This study demonstrates that the usage of digital devices and an increase in screen time can lead to ocular morbidities. However, similar studies are required to substantiate it further.

CONCLUSION

Screen time increases ocular morbidities, which can affect academic performance and well-being, according to the study. Thus, early counseling, evaluation, and treatment of ocular morbidity are needed to prevent vision and intellectual problems in school children. Ocular screening should be a regular part of the School Health Program. To identify common eye diseases in schoolchildren and suggest them for treatment, teachers can be trained. They should educate schoolchildren about ocular hygiene. Schools can create digital display device awareness and through mass communication and can be a valuable tool in prevention of early development of ocular morbidity in children.

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