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To Study Effect of Screen Exposure on Eyes of Children

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ABSTRACT
One of the most common problems in children is refractive error, which can lead to blindness. Although refractive errors cannot be prevented, they can be detected early with a routine eye exam and fixed with glasses, surgery, or corrective lenses. The current study's objectives were to determine the prevalence of refractive errors in association with watching television, personal computer, mobile among school-age children presenting at Ophthalmology OPD at Tertiary Care Hospital and schools of Badnapur Taluka. A total of 300 kids were randomly selected to find out how common refractive error is in the research population.

INTRODUCTION

Refractive errors are the second most common type of functional blindness and account for more than half of all known kinds of visual impairment. It burdens patient financially and affects their quality of life by posing psychological, functional aesthetic problems. When compared to other visual diseases, refractive disorders are more likely than other ocular diseases to have a high morbidity as shown by the number of years spent with impairment. Refractive defects can impair performance, lower employability and productivity even endanger patients' lives if they are not treated. Yet, correcting refractive errors with the appropriate eyewear is one of the most financially advantageous interventions in eye care[1]. Finding information regarding eye issues in school-aged children is challenging. Since one-third of India's blind individuals lose their sight before the age of 20, early detection and treatment of paediatric ocular morbidity is essential[2]. It is estimated that between 21% and 25% of patients who visit India's eye OPD have this widespread incidence. Refractive errors are most prevalent in children between the ages of 6 and 16 and can impact up to 20% of children by the age of 16[3-4]. Treatment and diagnosis of refractive problems are relatively simple and is one of the easiest ways to reduce imparted visions[5]. Refractive errors can be fixed by spectacles, contacts, or refractive surgery. The most popular and convenient way of refractive correction is wearing glasses since it is more convenient and less expensive. Developing countries have challenges to overcome in terms of eyewear affordability and accessibility[6]. The prevalence of refractive error was 6.7% in a cross-sectional survey of 15,954 schoolchildren in Sikkim, India, with myopia accounting for 335 (31.1%), astigmatism accounting for 317 (29.4%) hyperopia accounting for 29 (2.6%) of the students. The majority of people with refractive error were between the ages of 14 and 17 (9.2 percent)[7]. In an another case[8] a cross-sectional study carried out to evaluate the ocular morbidity among school-going teenagers studying between class 5 and class 10 in the age range of 10-16 years in rural north Maharashtra. The prevalence of ocular morbidities was estimated to be 27.65%. 10.2% of the 1000 elementary school pupils, aged 8-16, who participated in a study on the prevalence of refractive errors in schoolchildren in western Rajasthan were found to have refractive errors. Refractive flaws were primarily caused by myopia, hypermetropia astigmatism, accounting for 56.9, 13.7 and 29.4% respectively[9]. Seung-Hyun K and team[10] in a study investigated the effect of watching 3D TV on refractive error in children. They revealed that watching a 3D TV for 50 min with a 10 min intermission at more than 2.8 meter of distance did not affect the refractive error of children[10]. In another case of Madurai a cross sectional study of 600 students of 10-14 years of television watching effect it was found that prevalence of refractive errors in children was 16.2% as those who were watching television for more than five years have developed refractive errors significantly[11].

MATERIALS AND METHODS

18 months after receiving approval from the Ethics Committee, a cross-sectional study was conducted among all the kids in the age range of 6-16 to check for visual impairment. The investigation was conducted at the tertiary care center's ophthalmology OPD and close-by schools. Students from the chosen schools in the Badnapur Taluka and from the Tertiary care Hospital made up the study population. All the children in the children in the age group 6-16 years were

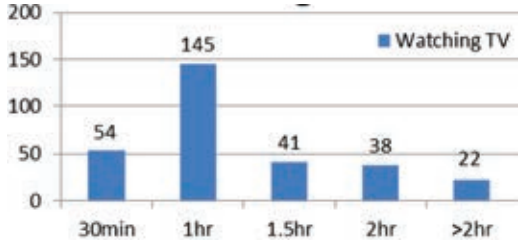

Fig 1: Distribution of time spent in watching TV (N=300)

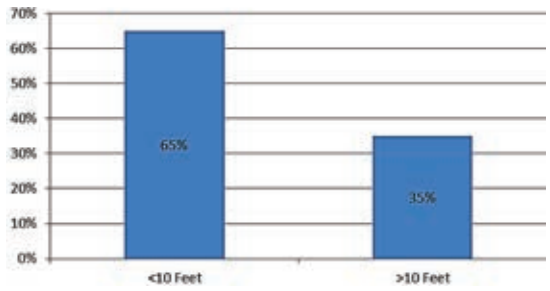

Fig 2: Distribution of TV watching distance (N=300)

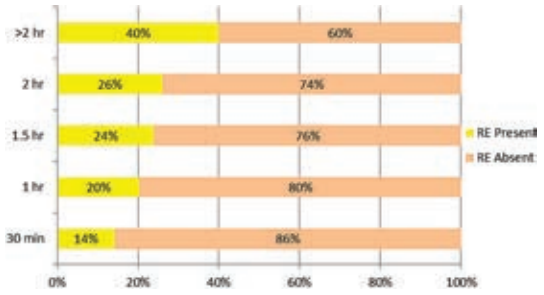

Fig 3: Effect of TV watching duration on Prevalence of refractive error

Table 1: Time spent in watching TV (N=300)

Time spent in Watching TV	No. of participants
30 min	54
1 Hr	145
1.5 hr	41
2hr	38
>2hr	22

Table 2: TV watching distance

TV watching distance	No. of participates	Percentage
<10 Feet	195	65
>10 Feet	105	35

Table 3: Effect of TV watching duration on Prevalence of refractive error

TV watching duration	Refractive error present	Refractive error absent
30 min	14%	86%
1 hr	20%	80%
1.5 hr	24%	76%
2 hr	26%	74%
>2hr	40%	60%

Table 4: Cross tabulation between TV watching distance and refractive error

	Refractive error		
TV watching distance	Present	Absent	Total
< 10 feet	46 (23.5%)	149(76.5)	195
> 10 feet	18 (17.2%)	87 (82.8)	105
Total	65 (21.6%)	235 (78.4%)	300

included in the study. Children aged 6-16 years who are admitted to a tertiary care hospital and nearby school are enrolled in the current prospective study after gaining prior consent from their parents or legal guardians for extra examinations and treatments. Keratometry, history-taking, clinical examinations of the front and back of the eye near-and far-vision tests are used to collect data. After that, children are examined using streak retinoscopy to check for refractive error while being cycloplegic by 1% cyclopentolate. A post-mydriatic test is used to establish the correct prescription for glasses after three days. The collected data is evaluated. Refractive faults that are not corrected are also noted.

RESULTS AND DISCUSSIONS

A total of 200 kids were randomly selected from Ophthalmology OPD at the Tertiary Care Hospital in Badnapur Taluqa and nearby school in order to gauge the prevalence of refractive error in the study population.

Distribution of time Spent in Watching TV: (Fig. 1) reveals that among the study participants, 54 (18.6%) watched television for 30 minutes per day, 145 (48.3%) for one hour per day, 41 (13.6%) for one and a half hours per day, 38 (12.6%) for two hours per day 22 (7.3%) for more than two hours per day (Table 1).

Distribution of TV Viewing Distance Among Participants: As per (Fig. 2) and (Table 2), 65% of participants in the survey watched television at a distance of <10 feet, while 35% watched from a distance >10 feet.

Association of Refractive Error with Risk Factors TV watching Duration and Refractive Error: The (fig. 3 and Table 3) shows that the incidence of refractive errors increases with increasing television viewing time. There is a statistically significant association between the time spent watching television and the prevalence of refractive errors. We can observed from (Table 3 and Fig 3) that there is a significant increase in incidence of refractive error among children as the TV watching duration increases from 30 min to more than 2 hr the percentage of refercetive errors also increases from 14%-40%.

TV watching Distance and Refractive Error: (Table 4) shows that among 300 children 195 watches TV with a distance less than 10 feet and out of 195 children 46(23.5%) found to have refractive errors. Whereas among 105 children, who watches TV by more than 10 feet distance, 18(17.2%) found to prevail vision problems. Therefore the study reveals that there is no statistically significant correlation between television viewing distance and refractive error prevalence. Among the study participants (N = 300), 65 childrens (21.6%) had refractive errors of which 16.61% had myopia and 2.65% had hypermetropia and remaining 2.32% had astigmatism.

CONCLUSION

The Incidence of refractive errors increases with increasing television viewing time. There is a statistically significant association between the time spent watching television and the prevalence of refractive errors. As far as the TV viewing distance is concerned there is no statistically significant

correlation between television viewing distance and refractive error prevalence hence we conclude that TV viewing distance did not affect much more on the refractive error of children.

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