

# The Incidence of Refractive Error in Children 5-10 Years Age Due to Excess Use of Smart Phone and Computer in 200 Cases

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## ABSTRACT

**Objective:** To assess the incidence of refractive error in children 5-10 years age due to excess use of smart phone and computer.

**Methods:** This prospective observational study is conducted at Southern medical college and hospital, Chattagram from March 2018 to December 2018 where a total of 200 children who were studied in different kindergarten and government school children in Chattagram City Corporation included in the study.

**Result:** During the study, 56% were male, and 44% were female. Most of the patients belong to middle economic status. 49% patients had myopia, followed by 25% patients had hypermetropia, 30% had Astigmatism.

**Conclusion:** From our study we can conclude that, the current school healthcare program in Chattagram lacks any proper system of child eye care. Therefore, the screening of children for refractive error and visual impairment should be conducted periodically (from kindergarten to grade 6 at a large-scale community level and should be integrated with regular school

screening programs and in preschool health screening.

**Keyword:** Refractive Error, Hypermetropia, Myopia, Astigmatism.

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## Article History:

Received: 12-11-2019, Revised: 05-12-2019, Accepted: 27-12-2019

Access this article online	
Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2020.6.1.004	

## INTRODUCTION

Worldwide, uncorrected refractive error is increasingly being recognized as a significant cause of avoidable visual disability, as evidenced by its inclusion in the priority areas of Vision 2020: The Right to Sight a global initiative launched by a coalition of nongovernmental organizations and the World Health Organization.<sup>1</sup>

Based on a national survey in 1996 worldwide among of all ages, 48% of those presenting with visual acuity worse than 20/63 in the better eye, and no evidence of cataract with torch light examination, improved to at least 20/63 with a pinhole.<sup>2</sup>

Indian children in 3 schools were examined by similar methods; myopia prevalence was 16% for those 7 to 12 years of age and 22% for those 13 to 18 years.<sup>3</sup> Refractive errors (RE) such as myopia, hypermetropia, and astigmatism are very common eye disorders. They are caused by an incongruity between the axial length and the refractive power of the optical elements of the eye. Visual problems due to uncorrected refractive errors (URE) in school-aged children have a profound impact on their educational, social, and general quality of life.

There are several factors that can influence the lack of correction of RE among children. These factors include unawareness of the problem by the child, the family, the community, or the public health authority; inability to afford refractive services; inadequate provision of affordable corrective lenses; and poor compliance to wearing spectacles.<sup>4</sup> In this study our main goal is to assess the incidence of refractive error in children 5-10 years age due to excess use of smart phone and computer

## OBJECTIVE

To assess the incidence of refractive error in children 5-10 years age due to excess use of smart phone and computer

## Methodology

**Type of Study:** Prospective observational study

**Study Period:** March 2018 to December 2018

**Study Population:** A total of 200 children who were studied in different kindergarten and government school children in Chattagram City Corporation included in the study.

**Place of Study:** Southern Medical College, and Hospital, Chattagram

**Sampling Technique:** Purposive

**Method:** Children whose parents did not consent to have their children examined or those children who were uncooperative during the test were excluded. Also, children who did not understand their role in the screening process or those who were already wearing contact lenses or glasses that compensated for

their RE to 6/6 were excluded. Thorough and detailed history, clinical examination and laboratory investigations were done in all cases and analyzed.

**Data Analysis:** After collection, data were entered into a personal computer and were edited, analyzed, plotted in graphs and tables. Data were analyzed by chi square test, Mann Whitney U tests, using the statistical package for social sciences (SPSS) version 20.

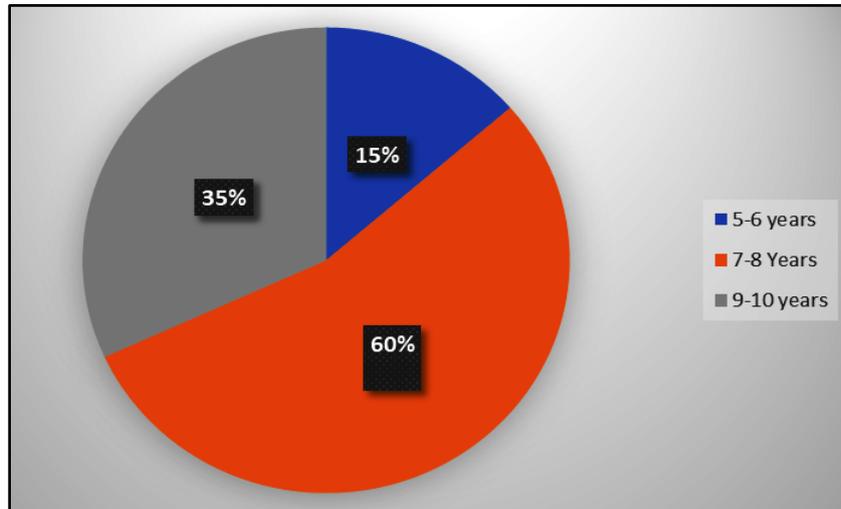


Figure 1: Age distribution of the patients.

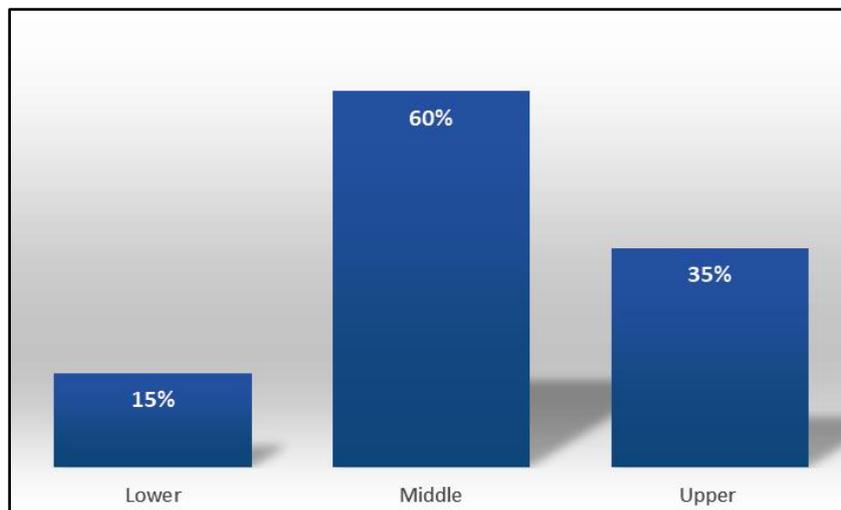


Figure 2: Socioeconomic characteristics of the patients.

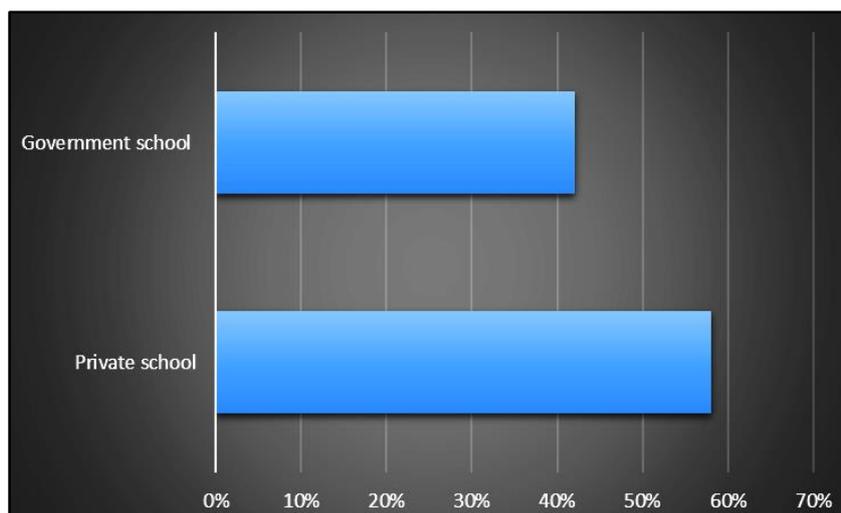


Figure 3: Types of school

**Table 1: Gender distribution of the patients**

Gender	%
Male	56%
Female	44%

**Table 2: Sociodemographic characteristic of the patients where**

Variable	%
Family member with spectacles	50%
No of hours per week for reading or writing	
28-35	15%
36-42	65%
>42	20%
No of hours per week for watching television	
0-14	15%
15-21	71%
21	14%
No of hours per week for playing computer game	
0-4	70%
1-4	20%
>4	10%

**Table 3: Causes of refractive error in the patients**

Causes	%
Hypermetropia	15%
Astigmatism	30%
Myopia	49%
Anisometropia	6%

**Table 4: Distribution of the patients according to risk factor**

Variable	Boys	Girls	P value
Reading in school	30±1.1	29±1.1	0.21
Reading in house	10±1.1	15±1.1	<0.01
Watching TV	20±1.1	26±1.1	0.12
Playing computer and mobile game	22.5±1.1	20±1.1	<0.001

## RESULTS

In figure-1 shows age distribution of the patients where most of the patients belong to 7-8 years age group, 60%.

In table-1 shows gender distribution of the patients where 56% were male and 44% were female.

In figure-2 shows socioeconomic characteristics of the patients where, most of the patients belong to middle economic status.

In figure-3 shows types of school where 58% studied at private school where as 42% were in government school.

In table-2 shows sociodemographic characteristic of the patients where 70% patients spent their time on computer 0-4 hours per week.

In table-2 shows causes of refractive error in the patients where, 49% patients had astigmatism, followed by 25% patients had hypermetropia, 30% had myopia.

In table-3 shows distribution of the patients according to risk factor where mean risk factors were distributed according gender of the patients.

## DISCUSSION

According to one study that, the prevalence of URE among children aged 3-10 years in Medina was 34.9% (95% CI = 32.8%-37.1%). This prevalence was significantly higher among children aged 6 to <8 years (53.5%) and those aged 8-10 years (42.5%). Also, detected URE did not vary by eye, and there was no aphakia in another article studied group. These prevalence values appear far higher than the prevalence values reported in other similar studies.<sup>6</sup>

In comparison to other countries, the prevalence of URE in this study was much greater. This observed variation from results of the previously mentioned could be attributed to the differences in the operational definition and cut-off points of RE.<sup>7</sup>

Another possible cause of this difference may be related to environmental influences. The better socioeconomic conditions in one study that affect lifestyle such as television viewing, excessive Internet use, and poor lifestyle habits affect low vision in schoolchildren.<sup>6</sup>

A one study conducted on children aged 6 to 18 years found that the proportion of children wearing glasses was higher among those using the Internet/television for more than 3 hours a day.<sup>5</sup> In a recent study, reported a significant difference between students with and without RE concerning daily hours of computer and TV use.<sup>7</sup>

Refractive error is one of the most common cases of visual impairment around the world and second leading cause of treatable blindness.<sup>8</sup> Blindness due to uncorrected or inadequately corrected refractive error is problem which may start at the younger age than older aged people. Any person who have the refractive errors may not corrected at younger age may suffer many more years of blindness that may create a social problem also. To avoidable blindness World Health Organization (WHO) are given main priorities to the refractive errors.<sup>9</sup> Based on WHO blindness in Singapore is 0.5%, Malaysia is 0.3%, Taiwan is 0.6%, Bangladesh is 1.5%, Indonesia is 2.2% and India is 4.3%.<sup>10</sup> In this study, we did not only focus on the magnitude of URE by age and gender, but we also focused on the role of these variables as risk factors for different types of RE.

## CONCLUSION

From our study we can conclude that, the current school healthcare program in Chattagram lacks any proper system of child eye care. Therefore, the screening of children for refractive error and visual impairment should be conducted periodically (from kindergarten to grade 6 at a large-scale community level and should be integrated with regular school screening programs and in preschool health screening

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**Source of Support:** Nil. **Conflict of Interest:** None Declared.

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**Cite this article as:** Aparna Das, Ahmadull Bari. The Incidence of Refractive Error in Children 5-10 Years Age Due to Excess Use of Smart Phone and Computer in 200 Cases. *Int J Med Res Prof.* 2020 Jan; 6(1):12-15. DOI:10.21276/ijmrp.2020.6.1.004