



# Incidence of Myopia in Relation to Close Work at Indus Medical College Hospital, Tando Mohammad Khan



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## Abstract

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**Purpose:** To evaluate the incidence of myopia in relation with close near work particularly in those children involved in using small screen tablets and mobiles phones.

**Material and methods:** This study was conducted between January 2016 to June 2016 to know the incidence of myopic refractive error in children between 1 to 12 years in outpatient department of Indus medical college hospital and particularly the effect of close work like using tablets and mobile phones upon these children. We included 453 children who were diagnosed as myopic and having astigmatism, most of the children 322(71.08%) were using tablets and mobile while 131 (28.91%) were not involve in using mobile and tablets. 197 (43.48%) were boys while remaining 256(56.51%) were girls. They were divided into different age groups i.e. 60 (13.24%) children, were in age group A, majority of children 230(50.77%) belonged to group B, 80 (17.66%) were in age group C, 50 (11.03%) in group D and 33(7.28%) were in age group E. All of the patients in groups A to C and those non co-operative from group D and E were under gone cycloplegic refraction.

**Results:** Out of 453 children 203(44.81%) found to have myopia of up to -3.0D, 87(19.20%) have myopia of up to -2.0D, 67(14.79%) have myopia of up to -4.0D and 96(21.19%) having myopia of -1.0D. majority of patients i.e. 301(66.44%) having astigmatism of up to -1D, 83(18.32%) have astigmatism of up to -2.0D, 52(11.47%) were having astigmatism of up to -3.0D and 17(3.75%) having astigmatism of up to -4.0D. Majority of patients (though female ratio higher than male ratio) were having myopic astigmatism of up to -1.0D, in the age group B i.e. between ages of 3 to 5 years and were involved in using mobiles and tablets.

**Conclusion:** Myopia is the more prevalent refractive error all over the world. In our study it is more prevalent in children between the ages 2 to 5 years of age particularly involved in close near work like apart from studying they were using mobiles and tablets particularly small screen for longer time. So better to use large screen avoid reading in dim light, do not use these small screens in lying position. Parents must take care while allowing the children to use mobiles and tablets screens must not be less than 12 inches in size better to allow them computers (desk top) rather than these small screens.

**Keywords:** Khan NA; Khan AA; Memon JI; Incidence of myopia in relation to close work at indus medical college hospital; Tando- Mohammad Khan

## Introduction

Uncorrected refractive errors are a common cause of preventable blindness worldwide [1] and myopia is the result of complex hereditary and environmental factors, [2] most prevalent refractive error [3] defined as near sightedness caused by an incongruity between the power of the optical elements of the eye and its axial length. The object image is projected in front of the retina, and corrective lenses are necessary to displace the image backward, thus producing a clear retinal image. Although the causes of myopia are unclear, evidence supports both genetic and environmental components, among which are

higher amounts of near work [4,5] years of education [6] and intelligence[7]. The world-wide urban rural patterns derived from both incidence and prevalence data are consistent with the near work hypothesis that increased reading and computer use may be a risk factor for myopia [5]. Researchers point to rigorous schooling system and the long hours children spend studying as being responsible for the high rates of myopia in Asia, rates that may be on the increase [8,9]. As myopia has onset and progression in childhood, it is important to focus research on these age groups.

**Material and Methods**

This study was conducted between January 2016 to June 2016 at Indus Medical College Hospital to know the incidence of myopic refractive error in children between 1 to 12 years and particularly to know the effect of using tablets and mobile phones upon these children. We included 453 children who were diagnosed as myopic and having astigmatism, most of the children 322 (71.08%) were using tablets and mobile while 131 (28.91%) were not involve in using mobile and tablets, (Table 1). 197 (43.48%) were boys while remaining 256 (56.51%) were girls, (Table 2). They were divided into different age groups i.e. 60 (13.24%) children were in age group A, majority of children 230 (50.77%) belonged to group B, 80 (17.66%) were in age group C, 50 (11.03%) in group D and 33 (7.28%) were in age group E, (Table 3). All of the patients in groups A to C and those non co-operative from group D and E were under gone cycloplegic refraction.

**Table 1**

Total No. of Patients Diagnosed as Myopic	Using Mobile Phones and Tablets	Not Using Mobile Phones and Tablets
453	322 (71.08%)	131 (28.91%)

**Table 2**

Total No. of Patients	Boys	Girls
453	197 (43.48%)	256 (56.51%)

**Table 3**

Groups	Age in Years	No. of Patients with %
A	1-2 yrs	60(-13.24%)
B	3- 5 yrs	230 (50.77%)
C	6- 8 yrs	80(-17.66%)
D	9- 10yrs	50(-11.03%)
E	11 -12 yrs	33(-7.28%)

**Results**

Out of 453 children 203 (44.81%) found to have myopia of up to -3.0D, 87 (19.20%) have myopia of up to -2.0D, 67 (14.79%) have myopia of up to -4.0D and 96 (21.19%) having myopia of -1.0D (Table 4). Majority of patients i.e. 301 (66.44%) having astigmatism of up to -1D, 83 (18.32%) have astigmatism of up to -2.0D, 52 (11.47%) were having astigmatism of up to -3.0D and 17 (3.75%) having astigmatism of up to -4.0D (Table 5).

**Table 4**

Range of Myopia	Upto-3.0D	Upto-2.0D	Upto-4.0D	Upto -1.0D
No. of Patients	203 (44.81%)	87 (19.20%)	67 (14.79%)	96 (21.19%)

**Table 5**

Range of Astigmatism	Upto -1.0D	Upto -2.0D	Upto -3.0D	Upto -4.0D
No. of Patients	301 (66.74%)	83 (18.32%)	52 (11.47%)	17 (3.75%)

Majority of patients (though female ratio higher than male ratio) were having myopic astigmatism of up to -3.0D, in the age group B i. e. between ages of 3 to 5 years and were involved in using mobile phones and tablets.

**Discussion**

In our study we included only patients between ages 1 to 12 years, were involved in close near work for long time particularly spending more time on mobile phones and tablets apart from their study time. We found that out of 453 myopic patients the highest rate of myopia, 44.81% was in the age group B (3-5yrs) and particularly these children were involved in using mobile phone and tablets for longer time, in a study done in 2011 at Dow University Hospital Karachi Pakistan by Rasheed et al. [10] shows rate of myopia was 26.6% while a multicenter study done in China, Chile and Nepal that shows the prevalence rates of myopia were 16.2%, 5.8% and 0.3% in China.

Chile and Nepal respectively it is less than our study in another study the rate was almost same as our study that was conducted in Singapore and china, the prevalence rate of myopia in Singapore children was 36.7% compared to Xiamen (China) which was 18.5%. Singapore has highly competitive educational system, whereas Xiamen school system is not so demanding, more near work activity may explain the difference in the prevalence rates [11,12]. An epidemiological study, concerning the prevalence of myopia among the student population (15-18 years old) though the age is high as compare to our study of Northern Greece, myopia prevalence was 36.8% same as our results, It was found that myopia correlates strongly with near work and school performance [13]. Boys in orthodox Jewish schools were found to have higher rates of myopia (81.3%) that is too high ratio as compared to our study while boys in general Jewish schools have only (27.4%) myopia. Orthodox schooling is characterized by sustained near vision and frequent change in accommodation due to the swaying habit during study [14]. In Xiamen, China the prevalence of myopia in urban school children was 19.3% and in rural school children was 6.6%. The average hours per day children spent in reading and writing outside of school was 2.2 hours in the city compared with 1.6 hours in the country side. These data suggest the prevalence of myopia

is higher in the city than in the country side. One possible explanation for these different rates could be that school children in the city spend more time reading and writing outside of school compared with children in the countryside. Myopic children in both the city and the countryside spent more time reading and writing compared with non myopic children. This increased near-work activity may contribute to the prevalence of myopia [15]. So the above studies prove same as ours that the time spent for close near work is directly related to the increase in prevalence of myopia with only change that children of this era are using mobile phones and tablets rather than only studying.

### Conclusion

Myopia is the more prevalent refractive error all over the world in our study it is more prevalent in children between the ages 2 to 5 years of age particularly involved in close near work like, apart from studying they were using mobiles and tablets particularly small screen for longer time. So better to use large screen avoid reading in dim light, do not use these small screens in lying position. Parents must take care while allowing the children to use mobiles and tablets, screens must not be less than 12 inches in size better to allow them computers (desk top) rather than these small screens.

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