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A Study to Assess the Impact of Visual Media Usage on Visual Acuity and Selected Visual Problems among Children Attending Selected Eye Hospital, Coimbatore

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Abstract

Visual impairment is a global public health problem. Children with low vision may suffer from delayed growth and developmental and education problems. The World Health Organization reported that every minute somewhere in the world, a child goes blind. For most of them, there is no curative treatment of the underlying pathology. Vision plays a vital role in a child's interpretation of the world. Visual impairment has a serious impact on a child's physical and emotional development. *Objectives:* The main aim of the study was to assess the Visual Media Usage, Visual Acuity and Visual problems of children and to correlate the impact of visual Media usage with visual acuity. *Methods:* Descriptive correlational study design, variables studied were Visual Media usage, Visual Acuity and Visual Problem. *Results:* Correlation indicates that the obtained 'r' value was 0.792. It implied that there was a positive correlation between Visual Media usage with Visual Acuity at $p<0.001$ levels. *Conclusion:* Children who were high VMU viewers had more visual related and other problems and low visual acuity when compared to children with normal viewing. Fathers those who are well educated and family income is more the availability of visual medias at home endangers children for high usage.

Keywords: Visual Media Usage (VMU); Visual Acuity (VA); Visual Problems; Log MAR Value.

Introduction

Eye is an organ which reacts to light for several purposes and allows vision as a conscious sense organ. Rod and Cone cells in the Retina allow light perception and vision including color differentiation and the perception of depth. The human Eye can distinguish about 10 million colors. Visual Acuity (VA) is a quantitative measure of the ability to identify black symbols on a white background at a standardized distance as the size of the symbols is varied (American Optometric Association, 1990).

Refractive errors occur when the shape of the eye prevents light from focusing directly on the Retina. The length of the eyeball either longer or shorter, the changes in the shape of the cornea, or aging of the lens can cause refractive errors. Nearsightedness (myopia) is a condition where the objects appear clearly, while objects far away appear blurry, when light comes to focus in front of the retina instead of on the Retina. Farsightedness (Hyperopia) is a common type of refractive error where distant objects may be seen more clearly than objects that are near. Astigmatism is a condition in which the eye does not focus light evenly onto the retina. This can cause images to appear blurry and stretched out, as the eye ages the lens can no longer change shape enough to allow the eye to focus close objects clearly (Vue, 2003).

Vision plays an important role in children interpretation of the world ,visual impairment has serious impact on a child physical and emotional development. Children with low vision may suffer

delayed growth and development. The American Acadamy of Pediatrics issued guidelines recommending children are watching television frequently can negatively affect early brain development (Al-Madhi,2002).

Normal VA based on the Snellen chart is 20/20, means that a person can see small detail from 20 feet away as same as a person with normal eyesight would see from 20 feet (6 meters). VA is measured with the help of Snellen chart. Snellen charts are named after the Dutch ophthalmologist Herman Snellen who developed the chart in 1862. Classification of Visual acuity by WHO 6/6 is normal, 6/9-6/12 considered mild Vision loss, 6/18-6/36 is considered moderate visual impairment, 6/60-3/60 is considered as severe Vision loss, 3/60-1/60 is considered as Blindness (World Health Organization, 1990).

A cross sectional study was conducted in India to determine the causes of severe visual impairment (SVI) and blindness, 4643 children from different school were participated in this study. Distance VA was measured for each eye using a Log Mar LEA chart. Visual loss was classified to the WHO categories of Visual Acuity defined as presenting VA <3/60 in the better eye, SVI as VA <6/60 to 3/60 in the better eye, and VI as VA <6/18 to 6/60 in the better eye. 65 children were identified with SVI 58.5% were blind and 41.5% were SVI. The major Anatomical site of SVI was the Retina in 33.8%, lens in 15.4% and normal appearing globe in 15.4%. The major underlying an etiology of SVI was undetermined in 56.9% and perinatal factors 21.5% mainly Retinopathy of Prematurity (Heijthuijsen, 2013).

The American Acadamy of pediatrics has recognised execssive TV viewing ,internet use as major contributions to childhood physical and mental health problems. Over use of visual medias causing visual problems in children ,because they are not following good viewing habits while watching the visual medias .In children because of their habits of watching visual medias like Television, Internet use, and playing Videogames, that they are not maintaing proper distance while watching TV. Children spend more than two hours per day in front of the Television and Internet (Gilbert, 1953).

A study was conducted in a selected school in Kanchipuram district in India. 628 students were screened, result of this study shows that, 30.57% of students were identified as vision defective, and from which 43.75% are Boys and 56.25% of them are Girls. Significant differences were found with respect of their Residential area that is 27.08% were in Rural, 34.37% of them were from Urban and 38.55% were residing in semi urban. But there was no awareness among the students and parents regarding the consequences of uncorrected vision problems. This statement has been proved, that the number of vision defective students wore glasses were 7.26%. The remaining 92.74% of students are unaware about their problems (Prema, 2011).

Extensive viewing of the computer screen can lead to eye discomfort, fatigue, blurred vision and headaches, dry eyes and other symptoms of eyestrain. These symptoms may be caused by poor lighting, glare, an improper work station set-up, vision problems of which the person was not previously aware, or a combination of these factors. Children can experience many of the same symptoms related to computer use as adults. However, some unique aspects of how children use computers may make them more susceptible than adults to the development of these problems (Kozeis, 2009).

The life style habits adopted by children as a result of spending time in front of television and computers screen are often determine to their health .children who are watching visual medias more ,spend less time doing physical activities, but they are eating snacks and packed food items in front of the visual medias, children who spend more times in front of television perform poor academically. This inverse relationship the grater viewing, lower the achievement for three basic skills that is reading, writing and mathematics. Excessive television seeing causing aggressive and violet activities in children (Ouarmby, 2009).

Vitamin A is an important for vision because it is needed to form the pigment Rhodopsin. Retina is the part of the eye that is responsible for converting light rays into neurological signals that can be converted into images. Cells in the Retina, known as the rods and cones, need Rhodopsin in order to absorb light rays. Rhodopsin is important for all kinds of vision, which allows you to see in low light conditions. A lack of vitamin A can impair body's ability to make Rhodopsin, resulting in vision problems. In children, vitamin A deficiency is the leading cause of preventable blindness and is typically due to malnutrition. Vitamin A deficiencies can also affect the vision. A mild deficiency can make it hard for you to see in low light conditions and can also cause small changes in the whites of your eyes. A severe deficiency results in eyes becoming dry, ultimately causing scarring of the eye that leads to blindness (Cole, 2011).

Methods

The study was conducted at Lotus Eye Hospital, Coimbatore, Tamilnadu, India among 150 outpatient children attending eye clinic in the year 2013. A prior formal written permission was obtained from the authorities of Lotus Eye Hospital and pediatric department to conduct the study. Informed consent was obtained from the parents and children. The investigator collected the data by interview method. First the child was enrolled for study, and then subjected for visual assessment with help of Snellen chart. The questionnaire was completed during the waiting time.

The instrument used for the present study was part I consist of ten questions regarding Visual Medias viewing habits of children. Scored as three, two, one the maximum score was 13 and minimum score is 10. Part 2 is the sleeping and eating habits of children, it has six questions. Scoring is three, two and one, Maximum score is 18 and minimum score is six. Visual acuity Performa consist of letters and numbers of different languages, 7 lines are there, going up letters size is increasing bottom six letters and top one letter is present. Visual Acuity is converted to Log MAR value. Demographic variables were Age, Gender, Gestational age at birth, Neonatal illness and Visual aid used, Father's occupation, Father's education, Mother's education, Mother's occupation, Family income, visual Medias available at home and Family food pattern.

Results

The outcome of the study was computed using SPSS package both descriptive and inferential statistics which are discussed under.

Demographic Characteristics of Child and Family

Includes 47 % of children belongs to the age group between 8-10 years and 63% of children were Female. A majority of the children 51.5 % born after > 37 completed weeks. 59% of children have no Neonatal Illness and 62% of children were not using any visual Aid. Family Profile include 44% of Fathers were Graduate, 36% have own business, 47% of mothers were graduate, 65% of mothers were house wife, 50% children from family income of Rs > 15000 per month and 76% of children were non vegetarian.

Visual Media Usage of Children

100 (72%) children used computer per day < 3 hours 94(62.7%) of children used Television > 6 hours per day. 111 (74%) children used Video Games less than 3 hours per day 87(58%) of children used < 20 hours per Week 35 (23.3%) of children used dim light and 43(28.7%) not using light while watching Television. 74(49.3%) of children sitting < 5 meters from the television. High usage of visual Medias 59% of children and 41% low usage of Visual Media. The mean value of visual media usage were 22.21.

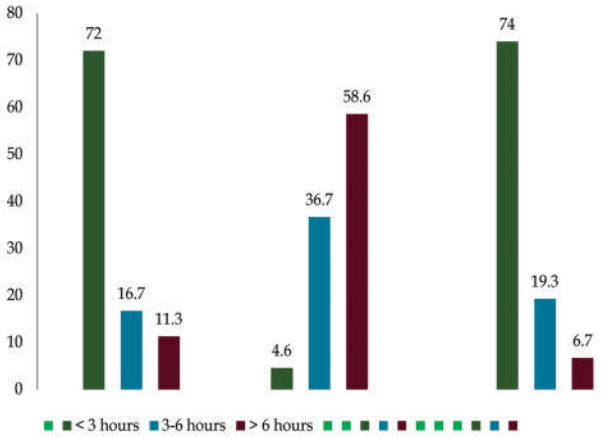

Fig. 1: Distribution of Computer, Television, Video Games Usage per Day

Eating and Sleeping Habits of Children

Most of the children 107 (70.9%) of children slept 6-8 hours in the night time. 113 (74.8%) of children usual bed time is after 10 'o' clock. Majority of children 146(96.7%) eating food while watching TV, most of them consumed fruits and vegetables more than three times per week 104(68.9%). 72(47.7%) of children eating Fish and Milk product four times per week. 81(83.6%) playing out door games only in weekend days.

Visual Acuity of Children

21(13.8%) children had VA 6/9, 26 (17.1%) had 6/12 VA, 26(17.1%) children had 6/18, 24(15.8%)

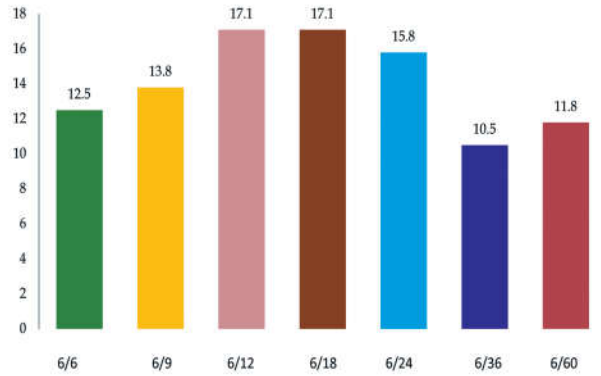

Fig. 2: Distribution of Visual Acuity of Children

had VA, 6/24, 16(10.5%) VA 6/36, 18(11.8%) children had VA more than 6/60. The mean value of visual acuity was 0.4723, high usage 0.6209 and low usage 0.2554.

Vision Related Problems

One child has more than one problem, most of the children had dim vision, Eye strain, Head ache, Eye inflammation 18.4%, 17.8%, 17.1%, 13.8% and none of the children had Swelling and Night Blindness.

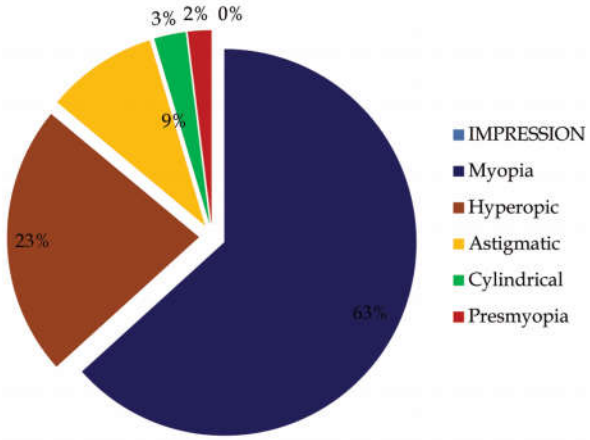

Fig. 3: Distribution of Vision Problems

Correlation between Visual Media Usage with Visual Acuity of Children

Positive correlation (r=0.79) significant at p<0.001] between the Visual Media Usage with Visual Acuity .The present study depicts high Usage of Visual Medias causing low Visual acuity in children.

Correlation between Visual Media Usage with Eye Problems

Correlation between VMU with eye problems of pain (0.308), Irritability (0.324), Itching (0.235), Redness (0.189), Watery Eye (0.359) shows significantly positive relationship between Visual Media usage with eye problems at p<0.05 level .

Association of Visual Media Usage with Child Profile and Family Profile

There is an association between Visual Media Usage with the gender- female children are more affected because of high usage (6.16) significant p<0.05 , In family profile Fathers Education (7.84) and Family Income (5.99) showed significant at p<0.05.

Conclusion

- Children who were high VMU viewers had more visual related and other problems and low visual acuity when compared to children with normal viewing.
- Fathers those who are well educated and family income is more, the availability of visual media at home endangers children for high usage.

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