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Research Article

PREVALENCE OF REFRACTIVE ERRORS AND THE FACTORS RELATED TO IT AMONG MADRASSA STUDENTS IN DISTRICT SIALKOT

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Abstract:

Introduction: Refractive errors comprise visual impairment arising from inability of eye to focus light on retina. Refractive errors include myopia, hyperopia, astigmatism and presbyopia. Many factors like age, family history, distance while watching screen and reading and illumination during activities contribute towards refractive error. Globally, uncorrected refractive errors contribute towards 43% of visual impairment with more than 12 million children aged between 5 to 15 years. Globally estimated pool prevalence of myopia, hyperopia and astigmatism in children was 11.7%, 4.6% and 14.9% respectively. In a country like Pakistan, not much study has been undertaken regarding refractive errors and madrassa are already deprived of school health services. With this background, the following study was charted up with following objectives:

Objectives: The objectives were to study the prevalence of refractive errors among Madrassa students aged 5 to 15 years in Sialkot and and to study the factors related to it.

Materials and methods: A descriptive cross sectional, study was conducted in Shahabia Madrassa, located in District Sialkot. 168 boys were selected randomly and examined by an ophthalmology team for RE. Data was collected on the pre-tested questionnaire and a checklist was used to observe variables like reading distance and room illumination. Data was entered and analyzed on SPSS 20. Prevalence was calculated in percentages and quantitative factors like age was expressed in mean, median and standard deviation, Chi square test was used as a test of significance and p value ≤ 0.05 was taken as significant.

Results: Mean age of boys was 12.3 years with $SD \pm 1.8$ Median being 12years .31.5%(53/168) of students had errors of refraction., out of which 26(49.1%) were diagnosed. 43/53students (81.1%) were myopic .4/53 students (7.6%) were hyperopic and 6/53 (11.3%) were astigmatic .31/78 boys (31.7%) were ≥ 13 years and 22/90 boys (24.4%) were <13 years had refractive error. Out of 53 with refractive error, 52/114boys (45.6%) had reading distance of < 25cm and 1/53 boys had (1.9%) ≥ 25 cm. 37/90 boys (41%) had positive family history and 16/78 boys (20%) with negative family history were also having refractive error. 11/66 (16.7%) had sufficient illumination for activities .9/59(15.3%) boys with <1 year of madrassa schooling and 44/65(40.4%) with > 1 year of madrassa schooling had refractive errors . Symptoms like irritation of eyes, blurring of vision and double vision were found to be significantly related (p values :0.005, 0.000, 0.013 respectively). Factors like age, years of madrassa schooling , illumination in indoor activities, distance while using screen, were found to be significant (p value was ≤ 0.05).

Conclusion: Refractive errors had a prevalence of 31.5% in madrassa students and half of them(49.1%) were diagnosed. Myopia (81.1%) being the commonest was followed by astigmatism(11.3%) and Hyperopia(7.6%) .Refractive errors were common in children with positive family history and age of \geq 13 years . Years of madrassa schooling \geq 1 had a positive relation with refractive errors. Mother education and occupation had a protective effect against the prevalence. Additionally, insufficient illumination, screen and reading distance (<25 cm) while reading and using screen were found to be significantly related. Symptoms such as blurring of vision, eyes irritation and diplopia were also significantly related. The study results show lack of screening among madrassa students and poor School Health Services. There is a need of awareness and education regarding student's health and measures should be taken accordingly to uplift health status of students who are already attending marginalized parallel education system.

Key words: Prevalence, Refractive Errors, Madrassa.

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INTRODUCTION:

Refractive error is a problem with focusing light accurately onto the retina due to the shape of the eye. Refractive error includes myopia, hyperopia, astigmatism, and presbyopia. It is the most common cause of reduced visual acuity. Both genetic and environmental factors are involved in the development of refractive error. Family aggregation, pedigree analysis, and twin studies all support the importance of genetic factors. Investigation of large families with high myopia or high hyperopia demonstrated inheritance as autosomal-dominant, autosomal-recessive, or X-linked traits. Mostly refractive error are more likely to be inherited as complex traits, while extreme forms are more likely to result from monogenic defects, especially those of early onset or those accompanied by other ocular and/or systemic anomalies.

Uncorrected refractive error is related to limitations in vision tasks and decreased quality of life. Despite the relatively easy intervention for refractive error, many people still suffer from vision impairment due to uncorrected refractive error, especially older persons. Improvement in the vision-dependent quality of life of older persons has been demonstrated when URE is corrected. Uncorrected refractive error is responsible for 43 percent of global vision impairment, with 5 million people having gone blind. Half of all cases of refractive error go undetected and untreated. This lack of treatment makes uncorrected refractive error (URE) the leading cause of blindness in children and adolescents. Due to uncorrected refractive errors, the more than 12 million visuallyimpaired children ages 5 to 15 also suffer critical setbacks in development since learning is often visually-based. Children are the most fragile social stratum for Visual impairment and blindness, although the incidences of these conditions are lower than in adults. Given the potential life of a child, a refractive error at the young age may have a lifelong impact [16]. In many middle-income and low-income countries, 30%-72% of childhood blindness is avoidable, and refractive error, which is easily correctable with glasses, is most common cause of bilateral visual impairment [17-18].

The findings of this study enrich the understanding on the issues important in people with refractive error. The quality of life issues identified will be used to develop a refractive error-specific item bank. A global initiative launched by a coalition of nongovernment organizations and the World Health Organization (WHO), aims to eliminate avoidable visual impairment and blindness at a global level. In order to achieve this goal it is important to know the prevalence of different refractive errors in a community. Children and teenagers are the most susceptible groups to be affected by refractive errors. So, this population needs to be screened for different types of refractive errors. The global health of uncorrected refractive error is improving but crude DALY rates are keeping constant, implying that health progress does not mean fewer demands of refractive services. Worldwide, older age, female sex, and lower socioeconomic status are related to higher URE burden. The findings of this study may raise public awareness of the global URE burden and are important for health policy making[15].

Many studies have been conducted to determine the prevalence of refractive errors throughout the world. The number of visually impaired persons in the world is about 259 millions. This estimate includes 98 million persons with visual impairment due to uncorrected refractive error[1] . Uncorrected refractive errors are the main case of visual impairment (VI) in developing countries (43%), followed by cataract (33%) [10]. This estimate is quoted widely, but because it is based on definitions using best-corrected visual acuity, uncorrected refractive error as a cause of visual impairment is excluded.

The global magnitude of low vision caused by uncorrected refractive error (near-sightedness, farsightedness or astigmatism) published in the Bulletin of the World Health Organization in 2010 is estimated to be 103 million [10] Refractive errors were not considered as a cause of blindness until recently, with the increasing use of the concept of presenting visual acuity (VA) for defining blindness [11]. However the distribution of blindness is not homogeneous throughout the world and blindness due to refractive error in a specific country suggests that its access to eye care services are in general poor because the management of a refractive error is probably the easiest and most effective eye care service [13-14].

In children, the Estimated pool prevalence of myopia, hyperopia, and astigmatism was 11.7%, 4.6%, and 14.9% respectively. The EPP of myopia ranged from 4.9% in South-East Asia to 18.2% in the Western Pacific region, the EPP of hyperopia ranged from 2.2% in South-East Asia to 14.3% in the Americas, and the EPP of astigmatism ranged from 9.8% in South-East Asia to 27.2% in the Americas. Uncorrected refractive errors are an important cause of visual impairment in many countries. In a study conducted at New Delhi, refractive error was the cause in 81.7% of eyes with vision impairment [8]. The refractive error was responsible for 1.1% legal blindness (which is defined as vision less than 6/60) and 0.5% economic blindness reported by Kalikivayi [9] Though some of the studies have been conducted in Pakistan, but except a few, many of them were either focused on adults or Afghani and Bangladeshi children [4-7]. These studies revealed that the prevalence of refractive error varies from 1% to 8%. Prevalence of uncorrected refractive errors in population of Pakistan was found to be 23.97% among males and 20% among females. The prevalence of visually disabling refractive errors was 6.89% in males and 5.71% in females.

Dandona et al estimated 12.3% total blindness was due to uncorrected refractive error, which is also responsible for a large number of blind years lived by a person than most other causes if left uncorrected. It was estimated that blindness due to refractive error resulted on an average of 30 years of blindness for each person as compared with 5 years of blindness due to untreated cataract for each person [3]. A study by Kalikivavi revealed that out of 115 children with Visual Acuity < 6/18 vision improved by = 6/18 with refraction in 109 (94 %). No child was legally or economically blind after refractive correction [9]. Although there is a growing interest in the elimination of avoidable blindness due to uncorrected refractive error[19], and the eye care services for children have improved [20], a recalculation of global estimates of prevalence, incidence, and cause of children's eye problems is needed.

The study was done with the objective to find the frequency of different types of refractive errors in students of madrasa in SIALKOT. This cross sectional study was done with 168 students between ages of 5–15 years in Madrassas. The students were screened for refractive errors and the types of the errors were noted. After screening for refractive errors-the glasses were prescribed to the students. Myopia was the most frequent refractive error in students, followed by hyperopia and astigmatism. This study showed that myopia is an important problem in madrassa population. Spectacle correction of refractive error is cheapest and easy solution of this problem.

Literature Review

Refractive Error is a problem with focusing light accurately on the retina. It means that shape of your eye does not bend light correctly resulting in a blurred image. The main types of RE are Myopia, Hyperopia, Presbyopia and Astigmatism. The symptoms are blurry vision, double vision, headaches, eye strain. The number of people globally with RE has been estimated at one to two billion. Rates vary between regions of the world with about 25% [1] of Europeans and 80% of Asians affected. Rates among adults are between 15-49% while rates among children are between 1.2-42%. Far sightedness more commonly affects young children and the elderly. Presbyopia affects most people over the age of 35.the number of people with RE that have been corrected was estimated at 660 million in 2013. Of these 9.5 million were blind due to the RE. it is one of the most common causes of vision loss along with Cataracts, Macular degeneration and Vit. A deficiency.

WHO estimates that 153 million people worldwide live with visual impairment due to uncorrected RE. RE prevalence in Europe collected between 1990-2013 based on cohort and cross sectional studies showed estimate of RE(myopia \leq -0.75D, high myopia \leq -6D, hyperopia \geq 1D and astigmatism \geq 1D). Meta-analysis was performed for 61,946 individual in 2010. The prevalence of myopia is 30.0% (95CI 30.4-30.9), high myopia is 2.7% (95CI 2.69-2.73), hyperopia is 25.2% (95CI 25.6-25.9) and astigmatism is 23.9% (95CI 23.7-24.1) [2].

A cross sectional study was conducted in China in December 2013 showed that the prevalence of uncontrolled visual acuity, presenting visual acuity and best controlled visual acuity in better eye [3] of \leq 20/40 was 19.8%, 15.5% and 1.7% respectively. Prevalence of myopia \leq -0.5D increased from 17.8%

to 52.2% while prevalence of hyperopia decreased from 17.8% to 2.6% in 10 years of age.

Myopia is a condition in which spherical equivalent objective refractive error is <-0.50D in either eve. High Myopia is a condition in which spherical equivalent objective refractive error is ≤-5.0D in either eye. The symptoms are distant objects appear blurry, close objects appear normal, headache, eye strain. The causes of myopia are combination of and environmental factors. genetic Manv environmental factors have been documented for having possible relation with risks for developing myopia in children such as socio-economic factors. near work and outdoor activities.[4] Near work activities (e.g. studying, reading, watching tv and using computer and mobile phones) have been identified in previous studies as possible environmental risk factors for myopia. Family aggregation, pedigree analysis and twin studies support the importance of genetic factors for causing myopia. The complications of myopia are cataract, retinal detachment and glaucoma. It is mostly corrected by using eye glasses, contact lenses and surgery.

Near sightedness is the most common eye problem and is estimated to affect 1.5 billion people (22% of the population). Rates vary significantly in different areas of the world. Rates among adults are between 15 and 49%. Rates are similar in males and females. Among children it affects 1% of rural Nepalese, 4% of South Africans, 12% of Americans and 37% in some large Chinese cities. Rates have increased since 1950's. Uncorrected near sightedness is one of the most common cause of visual impairment globally along with cataract, macular degeneration and vitamin A deficiency. The incidence of myopia within sampled population often varies with age, country, sex, race, ethnicity, occupation, environment and other factors. Variability in testing and data collection methods makes comparisons of prevalence and progression difficult. Prevalence of myopia has been reported as high as 70-90% in some Asian countries.[5] Singapore is believed to have the highest prevalence of myopia upto 80% of people have myopia. In China and Malaysia upto 41% of population is myopic. The prevalence of myopia in high school in China is 77% and in college is more than 80%.

Hyperopia is also known as far sightedness. It is a condition of the eye in which light is focused behind the retina instead of on it. This results in close objects appearing blurry while far objects appear normal. Other symptoms may include headache and eye

strain. People may also experience accommodative dysfunction, binocular dysfunction, amblyopia and strabismus. The cause is an imperfection of the eye. Often it occurs when the eye ball is too short or the lens or cornea is mishappened. Risk factors include family history of the condition, diabetes, certain medications and tumors around the eye. Diagnosis is based on eye examination. Management can occur with eye glasses, contact lenses and surgery. Glasses are easiest while contact lenses provide a wide field of vision.

In North and South America one retrospective cross sectional study evaluated a total of 784 randomly selected subjects between 2004-2010 at Inter American University. Hyperopia (spherical equivalent refractive >+0.50D) measured by means of subjective refraction was found in 51.5% of subjects [6]. In USA another study evaluated prevalence of refractive errors in white and African Americans pre school children depicted prevalence of high hyperopia (spherical equivalent refractive \geq +3.00D) was 8.9% in white children and 4.4% in African American children. In Europe a study was conducted in Norway. In this study 3137 persons were examined to determine prevalence of RE in young people. Prevalence of hyperopia increased with age from 13.2%-17.4%. In Poland 4422 school children were examined by means of retinoscopy. The percentage of children in age group from 6-18 years was 13.1%. In Asia rate of hyperopia tend to be lower than those myopia.

Astigmatism is a type of RE in which the eye does not focus light evenly on retina. This results in distorted or blurred vision at all distances. Other symptoms can include eye strain, headache and trouble in driving at night. If it occurs early on life it can result in amblyopia. The cause of astigmatism is unclear. It is believed to be partly related to genetic factors. The underlying mechanism involves an irregular curvature of the cornea or abnormality in the lens of the eye. Diagnosis is by an eye examination. 3 options exist for treatment: glasses, contact lens and surgery.

In Europe and Asia astigmatism affects between 30-60% of adults. People of all ages can be affected. According to an American study nearly 28.4% [7] children between the ages of 5-17 years have astigmatism. A large number of studies have shown that astigmatism increases with age. In across sectional study conducted in North East Iran eye examination was done using slit lamp bimicroscopy and fundoscopy. Out of 2635 participants who were screened 2124 were analysed. The prevalence of astigmatism was 32.2% (95% CI:30.2-34.2). astigmatism is significantly increased from 14.3%-67.2% (P<0.001). The prevalence of with-the-rule, against-the-rule and oblique astigmatism was 11.7%,18.1% and 2.4% respectively. The main corneal astigmatism was 0.73D which linearly increased with age (P<0.001).

Presbyopia is a condition related to the aging of the eye that results in progressively worsening ability to focus clearly on close objects. Symptoms include difficulty in reading small print, having to hold reading material farther away, headache and eye strain. It progressively worsens in those with greater than 35 years old. The prevalence of presbyopia is 100% by the age of 55 years. Its cause is the hardening of the lens, with advancing age lens loses its elasticity and accommodation to see near objects becomes difficult. Diagnosis is by eye examination. Treatment is typically with eye glasses. The eye glasses used have higher focusing power in the lower portion of retina.

In Southern India prevalence of presbyopia is 55% in people aged 30years and older. Female sex, rural residence, myopia and hyperopia were associated with presbyopia. A third of subjects with presbyopia were currently using spectacles. Duarte et al. in Brazil estimated the prevalence of presbyopia in 3000 adults of 30 years and older at 55% [8]. In those who had near vision spectacles, 30% had corrections that were ineffective. A total of 58% of the sample reported requiring new vision for their routine daily task. Studies conducted in Africa showed a younger onset of presbyopia than studies conducted in Europe and North America. In addition several studies have correlated geographical variations in the age at onset of presbyopia with latitude and climate, hotter climates are associated with earlier onset of presbyopia.

In the late 1990's, two papers from very different parts of the world Australia and India highlighted the fact that uncorrected refractive error was a leading cause of **Blindness** and major cause of blurred vision. Since then the WHO and the International Agency for the prevention of blindness, both separately and in their joint initiative VISION 2020: The right to sight, have worked very hard to put uncorrected refractive error on the blindness prevention agenda and to develop strategies for the elimination of this most simple avoidable cause of vision loss. 153 million people with uncorrected refractive error are either blind or visually impaired.[9] Blindness is defines as Best corrected visual acuity of worse than either 20/40 or 20/60. The term blindness is used for complete or nearly complete loss of vision. Less common causes of blindness include Vit. A deficiency. retinopathy of prematurity, ocular inflammatory disease, retinitis pigmentosa, primary and secondary malignancy of eve. optic neuritis, stroke, retrolental fibroplasias and blocked blood vessels. An estimated 19 million children below age 15 are visually impaired. Of these 12 million children have a vision impairment due to refractive error.[10] Around 1.4 million have irreversible blindness requiring access to vision rehabilitation services to optimize functioning and reduce disability. More than 3.4 million (3%) Americans are either legally blind (having visual acuity of 20/200) or worse or a visual field of less than 20 degrees or are visually Impaired having (visual acuity of 20/40 or less)

Globally 32.4 million people (95% CI, 29.4-36.5 million people; 60% women) were blind in 2010 and 191 million people (95% CI, 174-230 million people; 57% women) had moderate and severe visual impairment. The age standardized prevalence of blindness in older adults was more than 4% in western Sub Saharan Africa, 5.7% in Eastern Sub Saharan Africa, 4.4% in South Asia[11] and North Africa. A nationally representative sample of 16,507 adults was examined in Pakistan in 2003. The age and gender standardized prevalence of blindness was 2.7% (95% CI, 2.4%-2.9%). It has been estimated that there are 1,140,000 blind adults in Pakistan. One in eight blind adults has visual loss from sequelae of cataract surgery. Services for refractive errors need to b further expanded and integrated into eye care services particularly those serving rural population.

Blindness due to uncorrected or inadequately corrected natural refractive error starts at a younger age than cataract, which manifests it self in old age. If the impact of blindness due to refractive error is considered in terms of blind-person-years, a person becoming blind due to refractive error at a young age, and which is not corrected, would suffer many more years of blindness than a person becoming blind from cataract in old age and would place a greater socioeconomic burden on society. In the Indian state of Andhra Pradesh, among the individuals who are blind currently, the total number of blind-person years suffered over their lifetime by those blind due to refractive error was estimated to be about twice that suffered by those blind due to cataract. Blindness due to natural refractive error can hinder education.

personality development, and career opportunities, in addition to causing an economic burden on society. However, the impact of blindness from myopia may be different from that from hyperopia, since those blind due to myopia are likely to have better near vision than those who are so due to hyperopia. Though there are no data available on the economic loss as a result of blindness due to natural refractive errors, it would not be unreasonable to assume that it is probably significant since a large proportion of those affected are in the economically productive age group . However, this burden of economic loss may vary with the type of refractive error.

A mathematical simulation model was developed to estimate cost effectiveness of screening and correcting RE in school children in Africa, Asia, America and Europe. It shows that in all regions, screening of 5-15 years old children yields most health effects, followed by screening of 11-15 years old, 5-10 years old, and screening of 8 and 13 years old. Screening of broad-age intervals is always more costly than screening of single-age intervals, and there are important economies of scale for simultaneous screening of both 5-10 and 11-15-yearold children. In all regions, screening of 11-15 years old is the most cost-effective intervention, with the cost per DALY averted ranging from I\$67 per DALY averted in the Asian sub-region to I\$458 per DALY averted in the European sub-region. The incremental cost per DALY averted of screening 5-15 years old ranges between I\$111 in the Asian sub-region to I\$672 in the European sub-region.

A cross sectional study was conducted in rural areas of Iran in 2010 to determine prevalence of myopia, hyperopia and their relation with age. The study was conducted on 5-15 years old. Seventy schools were selected by multistage cluster sampling, of 4614 selected schoolchildren, 4106 participated in the study (response rate=89.0%) and 52.2% (n=2127) of the participants were male. Cycloplegic refraction was not done for 34 children due to lack of cooperation or having a contraindication, and eventually, we used data from 4072 children.Mean SE was 0.81D (95% CI: 0.72-0.90), and mean cylinder error was 0.51D (95% CI: 0.44-0.56). Mean SE was 0.77D (95% CI: 0.66-0.87) in boys and 0.85D (95% CI: 0.70-1.01) in girls (P=0.366). Analysis of variance revealed significant differences in SE among different cities (P<0.001)[12]. The prevalence of myopia was 3.04 (95%CI: 2.30-3.78), hyperopia was 6.20 (95%CI: 5.27-7.14), and astigmatism was 17.43 (95%CI: 15.39-19.46). The inter-sex differences were not significant in terms of myopia (P=0.925) and astigmatism (P=0.056) after adjusted cities, but the odds of hyperopia in girls was 1.11 (95% CI: 1.01–2.05) times higher than boys after adjusted cities (P=0.011) [13]

A cross sectional study was conducted in 2017 in Surendhranagar district Gujrat, India to determine the prevalence of refractive errors among school children of 10-15 years. The objectives were to find out prevalence of refractive errors among school going children, to find out various symptoms reported by school children and to access the use spectacles among school going children. [14] The results of which showed that overall prevalence of refractive error was 29.5%. 36.72% children showed moderate visual impairment, 3.96% children showed severe visual impairment [15]. Out of visually impaired children 61.92% children did not use spectacles.

A cross-sectional study was conducted in Guangzhou in 2016 to determine prevalence and associated factors of myopia among primary and middle school aged students. It demonstrated that of the students who read or studied for school assignments more than 2h per day, read for pleasure more than 2h per day, use computer more than 2h per week, watch Tv mora than 2h per week, played electronics more than 2h per week and read closer than 25cm as well as watch Tv closer than 3m, the proportions of myopia group were greater than no myopia group respectively (P value <0.05) [16] .Of the students in families with 2 myopic parents, 60.5% had myopia. By contrast, the students with only one myopic parents, 53.0% had myopia; the students without myopic parents, 43.7% had myopia.[17]

A cross sectional study of prevalence of refractive errors among school aged children in Gondar Town in, The Northwest Ethiopia comprised of 45.8% males and 54.2% females from 8 randomly selected elementary schools with a response rate of 93%. Refractive errors in either eye were present in 174 (9.4%) children. Of these, myopia was diagnosed in 55 (31.6%) children in the right and left eyes followed by hyperopia in 46 (26.4%) and 39 (22.4%) in the right and left eyes respectively. Low myopia was the most common refractive error in 61 (49.2%) and 68 (50%) children for the right and left eyes respectively.

The researches discussed uptill now were mainly conducted in school children to determine the prevalence of refractive errors.

Madrassas are the places which are usually ignored and they are a parallel system among school aged child for religious population. People at these places lack awareness about refractive errors and their health hazards. Mostly these people remain undiagnosed until they develop severe visual impairment. A cross sectional study was conducted in madressa students of Haripur district in 2015 to determine prevalence of refractive error. Visual impairment due to refractive errors is one of the most common problems among school-age children and is the second leading cause of treatable blindness. The Right to Sight, a global initiative launched by a coalition of non-government organizations and the World Health Organization (WHO), aims to eliminate avoidable visual impairment and blindness at a global level [18]. In order to achieve this goal it is important to know the prevalence of different refractive errors in a community. Children and teenagers are the most susceptible groups to be affected by refractive errors. So, this population needs to be screened for different types of refractive errors. The study was done with the objective to find the frequency of different types of refractive errors in students of madrassas between the ages of 5-20 years in Haripur[19]. Myopia being 52.6% was the most frequent refractive error among the students followed by hyperopia 28.4% and astigmatism 19%.[20] This study showed that myopia is an important problem in madressa population.

The following cross sectional study to determine the prevalence of refractive errors and factors related to it in Madrassa Dar-ul-uloom Shahabia, Rangpoora, district Sialkot. The objectives of this research are: To find the prevalence of refractive errors among 8-15 years old Madrassa students. To determine various factors in prevalence of refractive errors among Madrassa student.

The following study prerequisite for 4th prof in coordination with Eye department. They examined the eves of 168 students and data was collected regarding their routine activities through questionnaire. It was found that most students had 5-12 hours sleep time, 0-4 hrs screen time and 8 hours study time. About 52.4% had family history of refractive errors. Out of 168 students 53 were diagnosed with uncorrected refractive errors. The percentage of students with uncorrected refractive errors was: Myopia 81.1%, Hyperopia 7.6%, Astigmatism 11.3% and total 31.5%. So MYOPIA was more prevalent in those students.

Objectives:

The objectives of this study were:

- To find the prevalence of refractive errors among 5-15year old madrassa students in District Sialkot
- To study the factors related to it.

Operational Definition

Refractive errors: The main types of refractive errors are myopia(near-sightedness), Hyperopia(farsightedness), presbyopia(loss of near vision with age) and astigmatism. But only myopia, Hyperopia and astigmatism were considered in this study.

- **Myopia:** is defined as a spherical equivalent refractive error of at least -0.75D in one or both eyes on refractometer (near-sightedness)
- **Hyperopia:** is defined as a spherical equivalent refractive error of at least +2.00D or more in one or both eyes on refractometer (farsightedness).
- Astigmatism: is defined as (cylinder powers ≥ 0.05 DC or ≥ 1.00 DC) if one or both eyes were astigmatic.

Madrassa: A school where students gain religious knowledge especially learning the Holy Quran in Arabic by heart.

Madrassa student: Student (boys) gaining religious knowledge from the madrassa, ages ranging from 5 - 15 years are taken is this study.

Factors: Sociodemographic profile and personal habits are included in the research.

MATERIALS & METHODS:

Study Design: A cross-sectional study. **Study Population:** The study was conducted on students of Darul Aloom Shahabiya, Rangpura Sialkot. There are three registered madrissa implementing religious educations in distrcit Sialkot. The students were boys of ages ranging from 5-15 years. The madrassa had a total of about 350 students studying at the time.

Study Duration: The study was conducted over a period of 6 months.

Sample Size: The sample size calculated was 134 and the total number of samples collected was 168.

Result

You will need to measure **134** or more samples.

Confidence Level:	95% 🔻]
Confidence Interval:	5)%
Population Proportion:	13.7	%. Use 50% if not sure
Population Size:	500	Leave blank if unlimited population size.

Sample technique: The madrassa for study was chosen by convenient sampling and simple random sampling technique was used for the students as the questionnaire (annexure 1) was distributed randomly among the madrassa students in age group 5-15 years.

Sample selection:

- Inclusion criteria:
 - 1. Either day scholar and/or hostellites
- Exclusion criteria:
 - 1. All students with eye diseases other than refractive errors.
 - 2. Absentees and those not willing to participate.
 - 3. Students younger than 5 years of age and older than 15 years of age.

DATA COLLECTION:

Data collection Tool: A pre-tested semi-structured set of close ended questions in the form of a questionnaire .The refractive errors were checked using Snellen's chart, Autorefraction and retinoscope. Data collection Procedure: Data was collected after informed consent from the students parents and madrassa authorities. Only boys section was allowed access. The team consisted of ophthalmology department and 4th year students who visited the madrassa for 2 days. Ophthalmology equipment such as slit lamp and autorefraction were used. Factors like illumination were observed on a checklist. Factors such as sociodemographic and personal habits were collected by a pretested, semi-structured and close ended questionnaire filled by the 4th year students by asking the questions to the madrassa students before they were examined for any refractive error.

Data Analysis: Data was entered and analysed on SPSS 20. The qualitative variables like gender and type of refractive error were expressed in frequency

and percentage while quantitative variables like and age and income were expressed in mean, median and standard deviation. Chi square test was be used to find out relation and P value ≤ 0.05 was taken as significant.

Ethical consideration:

Formal permission was taken from authorities. Letters seeking permission were sent to the parents of the day scholar students while permission for the hostellites was taken from their teachers.

Variables:

Socio-demographic profile of students:

- Age
- Years of schooling
- Years of madrassa schooling
- Parental educational status (both father and mother)
- Parental occupation (both father and mother)
- Type of family
- Family income from all sources
- Family history

Personal habits:

- Total sleeping hours
- Total study time
- Outdoor activities
- Indoor activities
- Screen time
- Illumination
- Distance of text and screen
- Previous examination
- Previously diagnosed

Symptoms:

- Headaches
- Irritation in eyes
- Blurring of vision
- Double vision
- Diagnosis

	(n=168)	
	FREQUENCY	<u>rekcentage(%)</u>
	0	1 00/
3-0	<u>ð</u>	4.8%
9-10	13	/.8%
11-12	69	41.1%
13-14	53	31.5%
15	25	14.9%
Total	168	100%
Mean age 12.3274	Median 12.0000 S	D <u>+</u> 1.83935
YEARS OF SCHOOLING		
<5	83	49.4%
<u>>5</u>	85	50.6%
Total	168	100%
Type of DEWELLING	1	
Day scholar	39	23.2%
Hostellite	129	76.8%
Total	168	100%
YEARS in MADRASSA SCHC	OOL	
<1	59	35.1%
<u>>1</u>	109	64.9%
Total	168	100%
FATHER'S EDUCATION STA	ATUS	
Illiterate	70	41.7%
Under metric	61	36.3%
Undergraduate	35	20.8%
Graduate	2	1.2%
Total	168	100%
MOTHER'S EDUCATION ST	ATUS	100/0
Illiterate	85	50.6%
Under metric	68	40.5%
Undergraduate	14	8 3%
Graduate	1	0.6%
Total	1	100%
Total	108	100%
ATHERS'S OCCUDATION STA	TUS	
Unomplayed	20	11.00/
Solf omployed	20	11.7%
Unabillad work	/4	<u>++</u> 4%0 <u>28 60/</u>
Uliskilled WOFK	48	<u></u> 14.00/
Govi/private job	25	14.9%
Protessional	1	0.6%
Total	168	100%
IOTHER'S OCCUPATION STA		<1.001
Housewife	108	64.3%
Works inside the house	50	29.8%
Works outside the house	10	6.0%
Total	168	100%
YPE OF FAMILY		
Nuclear	72	42.9%
Extended	96	57.1%
Total	168	100%

 Table No.1

 Frequency distribution of Madrassa students according to their Sociodemographic profile

 (m=168)

<u>>10000PKR/ month</u>	143	85.1%
<10000PKR/month	25	14.9%
Total	168	100%
PLACE OF RESIDENCE		
Rural	96	57.1%
Semi urban	34	20.2%
Urban	38	22.6%
Total	168	100%
FAMILY HISTORY		
Yes	90	53.6%
No	78	46.4%
Total	168	100%

Table No.2: Frequency distribution according to personal habits related to refractive errors n=168

CHARACTERISTICS	FREQUENCY	PERCENTAGE (%)
SLEEPING HOURS		
≥8hours	95	56.5%
<8hours	73	43.5%
Total	168	100%
TIME SPENT STUDYING		
<u>></u> 9hours	138	82.1%
<9hours	30	17.9%
Total	168	100%
TOTAL TIME SPENT IN OUTD	OOR RECREATIONAL ACTIVI	ITIES
<u>></u> 1hour	149	88.7%
<1hour	19	11.3%
Total	168	100%
TOTAL TIME SPENT IN INDO	OR RECREATIONAL ACTIVITI	IES
<u>></u> 0.5	13	7.7%
<0.5	155	92.3%
Total	168	100%
TOTAL SCREEN TIME		
<u>></u> 0.5	93	55.4%
<0.5	75	44.6%
Total	168	100%
ILLUMINATION WHILE STUD	YING	
Sufficient	66	39.3%
Insufficient	102	60.7%
Total	168	100%
ILLUMINATION IN INDOOR A	CTIVITIES	
Sufficient	51	30.4%
Insufficient	117	69.6%
Total	168	100%
DISTANCE WHILE READING		
≥25cm	54	32.1%
<25cm	114	67.9%
Total	168	100%

DISTANCE WHILE SCREEN USING

<u>>25cm</u>	123	73.2%
<25cm	45	26.8%
Total	168	100%

Table no. 3
Frequency distribution of madrassa students according to symptoms related to refractive errors
n=168

CHARACTERISTICS	FREQUENCY	PERCENTAGE (%)			
HEADACHE					
Yes	127	75.6%			
No	41	24.4%			
Total	168	100%			
IRRITATION IN EYES					
Yes	56	33.3%			
No	112	66.7%			
Total	168	100%			
BLURRING OF VISION					
Yes	47	28.0%			
No	121	72.0%			
Total	168	100%			
DOUBLE VISION					
Yes	8	4.8%			
No	160	95.2%			
Total	168	100%			

 Table No.4

 Prevalence of Refractive errors among madrassa students

 n=168

CHARACTERISTICS	FREQUENCY	PERCENTAGE(%)
REFRACTIVE ERROR		
Yes	53	31.5%
No	115	68.5%
Total	168	100%
TYPE OF ERROR	n=53	
Муоріа	43	81.1%
Astigmatism	6	11.3%
Hyperopia	4	7.6%
Total	53	100%
DIAGNOSIS OF RE*	n=53	
Previously known	27	50.9%
Previously Undiagnosed	26	49.1%
Total	53	100%

*RE =Refractive Error

1 10

	REFRACTI	VE ERROR		P-VALUE ³
CHARACTERISTC	YES	NO	TOTAL	CHI
	FREQUENCY(%)	FREQUENCY(%)		SQUARE*
AGE (YEARS)		I	1	1
<u>></u> 13	31(39.7%)	47(60.3%)	78(100%)	0.045*
<13	22(24.4%)	68(75.6%)	90(100%)	4.529**
Total	53(31.5%)	115(68.5%)	168(100%)	
YEARS OF SCHOOLIN	١G			
<5	28 (33.7%)	55 (66.3%)	83 (100%)	0.363*
<u>>5</u>	25 (29.4%)	60 (70.6%)	85 (100%)	0.619**
Total	53(31.5%)	115(68.5%)	168(100%)	
YEARS OF MADRASS	A SCHOOLING			
<1	9 (15.3%)	50 (84.7%)	59 (100%)	0.001*
<u>></u> 1	44 (40.4%)	65 (59.6%)	109(100%)	11.179**
Total	53(31.5%)	115(68.5%)	168(100%)	
TYPE OF DWELLING				·
Day scholar	9 (23.1%)	30 (76.9%)	39 (100%)	0.240*
Hostellite	44 (34.1%)	85 (65.9%)	129(100%)	1.688**
Total	53(31.5%)	115(68.5%)	168(100%)	
FATHERS EDUCATIO	NAL STATUS			
Illiterate	28 (40.0%)	42 (60.0%)	70 (100%)	0.064*
Literate	25 (25.5%)	73 (74.5%)	98 (100%)	3.970**
Total	53(31.5%)	115(68.5%)	168(100%)	
MOTHERS EDUCATIO	DNAL STATUS			·
Illiterate	42 (49.4%)	43 (50.6%)	85 (100%)	0.000*
Literate	11 (13.3%)	72 (86.7%)	83 (100%)	25.425**
Total	53(31.5%)	115(68.5%)	168(100%)	
FATHERS OCCUPATI	ONAL STATUS			
Unemployed	6 (30.0%)	14 (70.0%)	20 (100%)	1.000*
Employed	47 (31.8%)	101 (68.2%)	148(100%)	0.025**
Total	53(31.5%)	115(68.5%)	168(100%)	

 Table No.5

 Relationship of Sociodemographic profile of madrassa students with refractive errors

MOTHERS OCCUPATIO	NAL STATUS			
Housewife	41 (38.0%)	67 (62.0%)	108 (100%)	0.024*
Employed	12 (20.0%)	48 (80.0%)	60 (100%)	5.763**
Total	53(31.5%)	115(68.5%)	168(100%)	
TYPE OF FAMILY				
Nuclear	19 (26.4%)	53 (73.6%)	72 (100%)	0.243*
Extended	34 (35.4%)	62 (64.6%)	96 (100%)	1.553**
Total	53(31.5%)	115(68.5%)	168(100%)	
FAMILY INCOME				
>10000	46 (32.2%)	97 (67.8%)	143 (100%)	0.817*
<10000	7 (28.0%)	18 (72.0%)	25 (100%)	0.171**

Total	53(31.5%)	115(68.5%)	168(100%)	
PLACE OF RESIDENCE				
Rural	29 (30.2%)	67 (69.8%)	96 (100%)	0.738*
Semi-urban/urban	24 (33.3%)	48 (66.7%)	72 (100%)	0.186**
Total	53 (100%)	115 (100%)	168 (100%)	
FAMILY HISTORY				0.005*
Yes	37 (41.1%)	53 (58.9%)	90 (100%)	8.210**
No	16 (20.5%)	62 (79.5%)	78 (100%)	
Total	53(31.5%)	115(68.5%)	168(100%)	

***(P VALUE <0.05 IS SIGNIFICANT)

Table No. 6Relationship of Personal habits of madrassa students with refractive errorsn=168

	REFRACTI	VE ERROR		P VALUE*	
CHARACTERISTIC	YES	NO	TOTAL	CHI	
	FREQUENCY(%)	FREQUENCY(%)		SQUARE**	
TOTAL SLEEPING HOU	RS				
<u>></u> 8 Hour	28 (29.5%)	67 (70.5%)	95 (100%)	0.616*	
<8 Hour	25 (34.2%)	48 (65.8%)	73 (100%)	0.435**	
Total	53(31.5%)	115(68.5%)	168(100%)		
TOTAL TIME SPENT ST	UDYING				
<u>>9</u> Hours	46 (33.3%)	92 (66.7%)	138 (100%)	0.387*	
<9 Hours	7 (23.3%)	23 (76.7%)	30 (100%)	1.141**	
Total	53(31.5%)	115(68.5%)	168(100%)		
TOTAL TIME SPENT IN	OUTDOOR RECREA	ATIONAL ACTIVITI	IES		
<u>>1 Hour</u>	45 (30.2%)	104 (69.8%)	149 (100%)	0.304*	
<1 Hour	8 (42.1%)	11 (57.9%)	19 (100%)	1.106**	
Total	53(31.5%)	115(68.5%)	168(100%)		
TOTAL TIME SPENT IN	INDOOR RECREAT	TIONAL ACTIVITIES	5		
<u>></u> 0.5Hours	2 (15.4%)	11 (84.6%)	13 (100%)	0.232*	
<0.5 Hours	51 (32.9%)	104 (67.1%)	155 (100%)	1.705**	
Total	53(31.5%)	115(68.5%)	168(100%)		
TOTAL SCREEN TIME					
<u>>0.5 Hours</u>	31 (33.3%)	62 (66.7%)	93 (100%)	0.619*	
<0.5 Hours	22 (29.3%)	53 (70.7%)	75 (100%)	0.308**	
Total	53(31.5%)	115(68.5%)	168(100%)		
ILLUMINATION IN INDOOR ACTIVITIES					
Sufficient	23(45.1%)	28 (54.9%)	51 (100%)	0.018*	
Insufficient	30 (25.6%)	87 (74.4%)	117 (100%)	6.226**	
Total	53(31.5%)	115(68.5%)	168(100%)		
ILLUMINATION WHILE STUDYING					
Sufficient	11(16.7%)	55(83.3%)	66(100%)	0.001*	
Insufficient	42(41.2%)	60(58.8%)	102(100%)	11.147**	
Total	53(31.5%)	115(68.5%)	168(100%)		

DISTANCE WHILE READING					
<u>></u> 25 cm	1 (1.9%)	53 (98.1%)	54 (100%)	0.000*	
<25 cm	52 (45.6%)	62 (54.4%)	114 (100%)	32.496**	
Total	53 (31.5%)	115 (68.5%)	168 (100%)		
DISTANCE WHILE USING SCREEN					

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<u>≥</u> 25 cm	22 (17.9%)	101 (82.2%)	123 (100%)	0.000*
<25 cm	31 (68.9%)	14 (31.1%)	45 (100%)	39.686**
total	53(31.5%)	115(68.5%)	168(100%)	
FAMILY HISTORY				
Yes	37 (41.1%)	53 (58.9%)	90 (100%)	0.005*
No	16 (20.5%)	62 (79.5%)	78 (100%)	8.210**
Total	53(31.5%)	115(68.5%)	168(100%)	

***(P VALUE <0.05 IS SIGNIFICANT)

Table No.7 Relationship of eye symptoms of madrassa students with refractive errors n=168

	REFRACTIV	TOTAL	P VALUE*			
CHARACTERISTIC	YES	NO		CHI		
	FREQUENCY(%)	FREQUENCY(%)		SQUARE**		
HEADACHE						
Yes	42 (33.1%)	85 (66.9%)	127(100%)	0.563*		
No	11 (26.8%)	30 (73.2%)	41 (100%)	0.559**		
Total	53(31.5%)	115(68.5%)	168(100%)			
IRRITATION IN EYE	S					
Yes	26 (46.4%)	30 (53.6%)	56 (100%)	0.005*		
No	27 (24.1%)	85 (75.9%)	112(100%)	8.614**		
Total	53(31.5%)	115(68.5%)	168(100%)			
BLURRING OF VISION						
Yes	25 (53.2%)	22 (46.8%)	47 (100%)	0.000*		
No	28 (23.1%)	93 (76.9%)	121(100%)	14.156**		
Total	53(31.5%)	115(68.5%)	168(100%)			
DOUBLE VISION			• •			
Yes	6 (75.0%)	2 (25.0%)	8 (100%)	0.013*		
No	47 (29.4%)	113 (70.6%)	160(100%)	7.344**		
TOTAL	53 (100%)	115 (100%)	168(100%)			

***(P VALUE <0.05 IS SIGNIFICANT)

RESULTS:

Frequency distribution of Madrassa students according to their Sociodemographic profile As shown in Table No. 1

AGE: Out of 168 students 123(73.2%) were greater than 12 years of age and 45(26.8%) were less than 12 years of age.

YEARS OF SCHOOLING: Out of 168 students 83(49.4%) had less than 5 years of schooling and 85(50.6%) had greater than 5 years of schooling.

DEWELLING: Out of 168 students 39(23.2%) were day scholars and 129(76.8%) were hostellites.

YEARS OF MADRASSA SCHOOLING: Out of 168 students 59(35.1%) studied for less than 1 year in madrassa and 109(64.9%) studied for more than 1 year.

FATHER'S EDUCATION STATUS: Out of 168 students' fathers 70(41.7%) were illiterate, 61(36.3%)

were undermetric, 35(20.8%) were undergraduate and 2(1.2%) were graduate.

MOTHER'EDUCATION STATUS:Out of 168 students's mothers 85(50.6) were illiterate,68(40.5%) were undermetric,14(8.3%) were undergraduate and 1(0.6%) were graduate.

FATHER'S OCCUPATION STATUS: Out of 168 students's fathers 20(11.9%) were unemployed,74(44%) were self employed,48(28.6%) were unskilled workers,25(14.9%) were doing Govt/Private job and 1(0.6%) were professionals.

MOTHER'S OCCUPATION STATUS: Out of 168 students's mothers 108(64.3%) were housewives,50(29.8%) work inside the house and 10(6.0%) work outside the house.

TYPE OF FAMILY: Out of 168 students 72(42.9%) had nuclear family and 96(57.1%) had extended family.

FAMILY INCOME: Out of 168 students's families 143(85.1%) had greater than 10,000 family income from all sources and 25(14.9%) had less than 10,000 family income.

PLACE OF RESIDENCE: Out of 168 students's families 96(57.1%) were living in rural areas,34(20.2%) were living in semi urban areas and 38(22.6%) were living in urban territories.

FAMILY HISTORY: Out of 168 students 90(53.6%) had family history of refractory errors and 78(46.4%) did not.

Frequency distribution according to personal habits related to refractive errors As shown in Table No. 2

SLEEPING HOURS: Out of 168 students 95(56.5%) had greater than 8hours of sleep per 24hours and 73(43.5%) had less than 8hours of sleep. **TIME SPENT IN STUDYING:** Out of 168 students 138(82.1%) were spending greater than 9hours on studying and 30(17.9%) were spending less than 9hours on studying.

TOTAL TIME SPENT IN OUTDOOR RECREATIONAL ACTIVITIES: Out of 168 students 149(88.7%) were spending greater than lhour in outdoor recreational activities and 19(11.3%) were spending less than lhour in recreational activities.

TOTAL TIME SPENT IN INDOOR RECREATIONAL ACTIVITIES: Out of 168 students 13(7.7%) were spending greater than 0.5 hours on recreational activities and 155(92.3%) were spending less than 0.5hours on recreational activities.

TOTAL SCREEN TIME: Out of 168 students 93(55.4%) were spending greater than 0.5 hours on screen and 75(44.6%) were spending less than 0.5 hours on screen.

ILLUMINATION WHILE STUDYING: Out of 168 students 66(39.3%) had sufficient illumination while studying but 102(60.7%) had insufficient illumination.

ILLUMINATION IN INDOOR ACTIVITIES: Out of 168 students 51(30.4%) had sufficient illumination in indoor activities and 117(69.6%) had insufficient illumination.

DISTANCE WHILE READING: Out of 168 students 54 (32.1%) had greater than or equal to 25cm distance from book while reading and 114(67.9%) had distance less than 25cm.

DISTANCE WHILE SCREEN USING: Out of 168 students 123(73.2%) had distance greater than or equal to25cm and 45(26.8%) had distance less than 25cm.

Frequency distribution of madrassa students according to symptoms related to refractive errors As shown in Table No. 3

Refractive error: Out of 168 students 53(31.5%) had refractive error and 115 (68.5%) had normal vision. **Type of refractive error:**

MYOPIA: Out of 168 students 43(81.1%) had

myopia.

HYPEROPIA: Out of 168 students 4(7.6%) had Hyperopia.

ATIGMATISM: Out of 168 students 6(11.3%) had astigmatism.

Diagnosis of refractive error: Out of 53 diagnosed students 27(50.9%) were previously diagnosed and 26(49.1%) were newly diagnosed(previously undiagnosed).

Relationship of Sociodemographic profile of madrassa students with refractive errors As shown in Table No. 5

AGE: Out of 78 students of age greater than or equal to13 years 31(39.7%)were diagnosed with refractive error and 47(60.3%) had normal vision and out of 90 of age less than 12 years 22(24.4%) were diagnosed with refractive error and 68(75.6%) had normal vision..

P-value is **0.045** which is ≤ 0.05 so this value is significant.

YEARS OF SCHOOLING: Out of 83 students having years of schooling less than 5 28(33.7%) were diagnosed with refractive errors and 55(66.3%) had normal vision. Out of 85 students having years of schooling greater than or equal to 5 years 25(29.4%) were diagnosed with refractive errors and 60(70.6%) had normal vision.

P-value is **0.619** which is >0.05 so this value is **insignificant**.

YEARS OF MADRASSA SCHOOLING: Out of 59 students having madrassa schooling less than 1 year 9(15.3) were diagnosed with refractive errors and 50(84.7%) had normal vision. Out of 109 students having madrassa schooling grater than or equal to 1 year 44(40.7%) were diagnosed with refractive errors and 65(59.6%) had normal vision.

P-value is **0.001** which is ≤ 0.05 so the value is significant.

TYPE OF DWELLING: Out of 39 day scholars 9(23.1%) were diagnosed with refractive errors and 30(76.9%) had normal vision. Out of 129 hostellites 44(34.1%) were diagnosed with refractive errors and 85(65.9%) had normal vision.

P-value is 0.240 which is > 0.05 so the value is insignificant.

FATHERS EDUCATIONAL STATUS: Out of 70 illiterate fathers sons 42(49.4%) were diagnosed with refractive errors and 42(50.6%) had normal vision. Out of 98 literate fathers sons 25(25.5%) were diagnosed with refractive errors and 73(74.5%) had normal vision.

P-value is **0.064** which is >0.05 so the value is **insignificant**.

MOTHERS EDUCATIONAL STATUS: Out of 85 illiterate mothers sons 42(49.4%) were diagnosed with refractive errors and 43(50.6%) had normal vision. Out of 83 literate mothers sons 11(13.3%) were diagnosed with refractive errors and 72(86.7%) had normal vision.

P-value is **0.000** which is ≤ 0.05 so the value is significant

FATHERS OCCUPATIONAL STATUS: Out of 20 unemployed fathers sons 6(30.0%) were diagnosed with refractive errors and 14(70.0%) had normal vision. Out of 143 employed fathers sons 47(31.8%) were diagnosed with refractive errors and 101(68.2%) had normal vision.

P-value is **1.0000** which is ≥ 0.05 so the value is insignificant.

MOTHERS OCCUPATIONAL STATUS: Out of 108 housewives sons 41(38.0%) were diagnosed with refractive errors and 67(62.0%) had normal vision. Out of 60 employed mothers sons 12(20.0%) were diagnosed with refractive errors and 48(80.0%) had normal vision.

P-value is **0.024** which is ≤ 0.05 so the value is significant.

TYPE OF FAMILY: Out of 72 nuclear families 19(26.4%) were diagnosed with refractive errors and 53(73.6%) had normal vision. Out of 96 extended families 34(35.4%) were diagnosed with refractive errors and 62(64.6%) had normal vision.

P-value: is **0.243** which is >0.05 so the value is **insignificant.**

FAMILY INCOME: Out of 143 families with income ≥ 10000 46(32.2%) were diagnosed with refractive errors and 97(67.8%) had normal vision. Out of 25 families with income <10000 7(28.0%) were diagnosed with refractive errors and 18(72.0%) had normal vision.

P-value is **0.817** which is >0.05 so the value is **insignificant**.

PLACE OF RESIDENCE: Out of 96 rural residing families 29(30.2%) were diagnosed with refractive errors and 67(69.8%) had normal vision. Out of 72 urban/semi-urban residing families 24(33.3%) were diagnosed with refractive errors and 48(66.7%) had normal vision.

P-value is **0.738** which is >0.05 so the value is insignificant.

FAMILY HISTORY: Out of 90 students with family history 37(41.1%) were diagnosed with refractive errors and 53(58.9%) had normal vision. Out of 78 students with family history 16(20.5%) were diagnosed with refractive errors and 62(79.5%) had normal vision.

P-value is **0.005** which is ≤ 0.05 so the value is significant.

Relationship of Personal habits of madrassa students with refractive errors As shown in Table No. 6

TOTAL SLEEPING HOURS: Out of 95 students with sleeping hours ≥ 8 hours 28(29.5%) were diagnosed with refractive errors and 67(70.5%) had normal vision. Out of 73 students with sleeping hours <8 hours 25(34.2%) were diagnosed with refractive errors and 48(65.8%) had normal vision.

P-value is **0.616** which is >0.05 so the value is **insignificant**.

TOTAL TIME SPENT STUDYING: Out of 138 students with \geq 9hours sleep 46(33.3%) were diagnosed with refractive errors and 92(66.7%) had normal vision. Out of 138 students with <9hours sleep 7(23.3%) were diagnosed with refractive errors and 23(76.7%) had normal vision.

P-value is **0.387** which is >0.05 so the value is **insignificant**.

TOTAL TIME SPENT IN OUTDOOR RECREATIONAL ACTIVITIES: Out of 149 students with ≥ 1 hour outdoor activities 45(30.2%) were diagnosed with refractive errors and 104(69.8%) had normal vision.Out of 19 students with <1 hour outdoor activities 8(42.1%) were diagnosed with refractive errors and 11(84.6%) had normal vision.

P-value is **0.304** which is >0.05 so the value is **insignificant**.

TOTAL TIME SPENT IN INDOOOR RECREATIONAL ACTIVITIES: Out of 13 with \geq 0.5 hours of indoor activities 2(15.4%) were diagnosed with refractive errors and 11(84.6%) had normal vision. Out of 155 with <0.5 hours of indoor activities 51(32.9%) were diagnosed with refractive errors and 104(67.1%) had normal vision.

P-value is **0.232** which is >0.05 so the value is **insignificant**.

TOTAL SCREEN TIME: Out of 93 with screen time ≥ 0.5 hours 31(33.3%) were diagnosed with refractive errors and 62(66.7%) had normal vision. Out of 75 students with screen time <0.5 hours 22(29.3%) were diagnosed with refractive errors and 53(70.7%) had normal vision.

p-value is **0.619** which is >0.05 so the value is **insignificant**.

ILLUMINATION IN INDOOR ACTIVITIES: Out of 51 students having sufficient illumination in indoor activities 23(45.1%) were diagnosed with refractive errors and 28(54.9%) had normal vision. Out of 117 students having insufficient illumination in indoor activities 30(25.6%) were diagnosed with refractive errors and 87(74.4%) had normal vision.

P-value is **0.018** which is ≤ 0.05 so the value is significant.

ILLUMINATION WHILE STUDYING: Out of 66 students having sufficient illumination while studying 11(16.7%) were diagnosed with refractive errors and 55(83.3%) had normal vision. Out of 102 students having insufficient illumination while studying 42(41.2%) were diagnosed with refractive errors and 60(58.8%) had normal vision.

P-value is **0.001** which is ≤ 0.05 so the value is significant.

DISTANCE WHILE STUDYING: Out of 54 students with distance while studying ≥ 25 cm 1 (1.9%) was diagnosed with refractive errors and 53(98.1%) had normal vision. Out of 114 students with distance while studying <25cm 52(45.6%) was diagnosed with refractive errors and 62(54.4%) had normal vision.

P-value is **0.000** which is ≤ 0.05 so the value is significant.

DISTANCE WHILE USING SCREEN: Out of 123 students with \geq 25cm distance 22 (17.9%) were diagnosed with refractive errors and 101(82.2%) had normal vision. Out of 45students with < 25cm distance 31 (68.9%) were diagnosed with refractive errors and 14(31.1%) had normal vision.

P-value is **0.000** which is ≤ 0.05 so the value is significant.

Relationship of eye symptoms of madrassa students with refractive errors As shown in Table No. 7

HEADACHE: Out of 127 students who get headache 42(33.1%) were diagnosed with refractive errors and 85(66.9%) had normal vision. Out of 41 students who do not get headache 11(26.8%) were diagnosed with refractive errors and 30(73.2%) had normal vision.

P-value is 0.563 which is > 0.05 so the value is insignificant.

IRRITATION IN EYES: Out of 56 students get irritation in eyes 26(46.4%) were diagnosed with refractive errors and 30 (53.6%) had normal vision. Out of 112 students get irritation in eyes 27(24.1%) were diagnosed with refractive errors and 85 (75.9%) had normal vision.

P-value is **0.005** which is ≤ 0.05 so the value is significant.

BLURRING OF VISION: Out of 47 students who get blurring of vision 25(53.2%) were diagnosed with refractive errors and 22(46.8%) had normal vision. Out of 121 students who do notget blurring of vision

28(23.1%) were diagnosed with refractive errors and 93(76.9%) had normal vision.

P-value is **0.000** which is ≤ 0.05 so the value is significant.

DOUBLE VISION: Out of 8 students who get double vision 6(75.0%) were diagnosed with refractive errors and 2(25.0%) had normal vision. Out of 160 students who do not get double vision 47(29.4%) were diagnosed with refractive errors and 113(70.6%) had normal vision.

P-value is **0.013** which is ≤ 0.05 so the value is significant.

DISCUSSION:

Refractive error is the problem with focusing light onto the retina due to the shape of the eye. Refractive error includes myopia, hyperopia, astigmatism, and presbyopia. Refractive error is the most common cause of reduced visual acuity. Both genetic and environmental factors are involved in the development of refractive error. Mostly refractive errors are more likely to be inherited as complex traits while extreme forms are more likely to result from monogenic defects especially those of early onset or those accompanied by other ocular or systemic anomalies. An uncorrected refractive error is related to limitations in vision-related tasks and decreased the quality of life. Due to uncorrected refractive errors more than 12 million visually impaired children ages, 5 to 15 years usually suffers a critical setback in development as learning in this age is often visual-based.

This cross-sectional study was done to find out the prevalence of refractive errors and factors related to it in Madrassa Dar-ul-Uloom Shahabia, Rangpura, district Sialkot among 5-15 years old Madrassa students .The researches discussed until now were mainly conducted in school children to determine the prevalence of refractive errors. MADRRASSAS are the places which are usually ignored and they are a parallel system among school-aged child for the religious population. Children of these places often lack awareness about refractive errors and their health hazards. Mostly these children remain undiagnosed until they develop severe visual impairment. This study was done in coordination with Dr. Intezar Hussain (Prof. of Ophthalmology) and his team. After taking consent the team examined the eyes of 168 male students and data was collected regarding their sociodemographic profile and personal habits through a pretested semi-structured questionnaire. It was unfortunate for the team that they couldn't access the girls section of the madrassa as they were not permitted. The tools used for data collection were a semi-structured questionnaire which was filled and

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by asking questions verbally. A total of 168 students were selected by simple sampling technique. Both hostilities and day scholars were included in this study and the students with eye disease other than refractive error are excluded.

In this study, a sample of 168 madrassa students was taken and 53/168 (31.5%) students were diagnosed with some refractive error but remaining 115/168 (68.5%) students found to have the healthy vision and had no refractive error. Total diagnosed cases of refractive error were 53, out of which 27 (50.9%) were previously known while 26 (49.1%) were previously undiagnosed, therefore were unaware of their eye health.

In the present study, 43/53 (81.1%) students were diagnosed with myopia, 4/53 (7.6%) had hyperopia and 6/53 (11.3%) had astigmatism. Hence, myopia was more prevalent in our study. A similar study was conducted among madrassa students of Haripur district in 2015 to determine the prevalence of refractive error between the ages of 5–20 years [19]. Myopia being 52.6% was the most frequent refractive error among the students followed by hyperopia 28.4% and astigmatism 19% [20]. Both studies showed myopia has most prevalence among refractive errors in madrassa population.

In our study, according to sociodemographic profile, the age group considered was 5 to 15 years. The number of students between the age group 5-8 years were 8/168 (4.8%), age group 9-10 years were 13/168 (7.8%), age group 11-12 years were 69/168 (41.1%), age group 13-14 years were 53/168(31.5%), age group 15 years were 25/168 (14.9%). In our study, the number of students \leq 13 years is 90, 22/90 (24.4%) students had the refractive error while 68/90 (75.5%) students had no refractive error. The number of students \geq 13 years is 78 and it was found that among the students of age \geq 13 years only

that among the students of age ≥ 13 years only 31(39.7%) students had the refractive error and 47(60.3%) students had no refractive error. Its p-value was 0.045 which is significant so age has the relation with refractive error. The prevalence of refractive error in our study increases with age giving similar results in a study conducted in rural areas of Iran in 2010 to determine the prevalence of refractive errors and their relation with age [12]. The prevalence of refractive error increased from 1.16% in 5–7 year age group to about 6% in 14–15 year age group, and the relation between age and refractive error prevalence was significant[13] as shown in our study.

In this study, it was found that 9/59 (15.3%) students that have <1 year of madrassa schooling get the

refractive error while 50/59 (84.7%) have no refractive error. Among the students that spend ≥ 1 years at madrassa 44/109 (40.4%), students have the refractive error while 65/109(59.6%) students have no refractive error. Its p-value is 0.001 which is significant ,so years of madrassa schooling have relation with refractive error and prevalence of RE increased with time spent at madrassa with increased study demand, which is supported by the study conducted in Norway and another study conducted in Chongqing, China[21] in which there is strong relation found between the increased study demand and RE.

It was studied that mother's education has a greater impact on the visual acuity of a child. It is obvious that if a mother is literate she has more knowledge of the factors that may cause decreased visual acuity or some sort of refractive error in her child. Education level could be considered a surrogate of factors related to refractive errors, such as socioeconomic background, intelligence, and near-work activity. Watching TV and spending long hours on computer games as well as the demand to cope with academic activity are all the probable factors contributing to a high percentage of refractive error. Similar results were found in our study which showed the protective relation of maternal literacy and occupation with the prevalence of RE (p-value is 0.000). Similar results were found by Sanga L et al in India [8].

In the present study, the factors such as the type of dwelling, father's educational status, father's occupation, family type, family income and place of residence had no relation with refractive error in students.

90 /168 had a positive family history of refractive error and 37/90(41.1%) students of positive family history had the refractive error while 53/90(58.9%) students had no refractive error despite positive family history. So, Family history has an relation with RE because of significant p-value (0.005). A similar study was conducted in Guangzhou in 2016 to determine the prevalence and associated factors of RE [16], in which strong relation was found between family history and RE as shown in our study. In present study, there was no longer relation of total sleeping hours, total time spent studying, total time spent in outdoor recreational activities and total time spent in indoor recreational activities and total screen time, with RE which was contrasted with the results found in 2002, by Mutti and associates reported on relations between RE in children and higher amount of time spent for studying and reading, smaller amount of time spent in outdoor activities [21]. The

reason for our contrasting results might be madrassa students have fewer chances for outdoor activities and limited access to digital devices and androids, thus due to lesser exposure to screen there is a muchreduced risk and no relation found.

Illumination while indoor activities and illumination while studying had been found a strong relation in our study showing p values (0.018 and 0.001) respectively. The similar finding in the study done in China among children also suggests the significant relation with the illumination of light [9].

It was observed that at distance >25 cm while using screen 22/123 (17.9%) students had the refractive error while 101/123 (82.2%) students had no refractive error. Among the students using the screen at <, 25cm 31/45 (68.9%) had the refractive error while 14/45(31.1%) students had no refractive error. Its p-value is 0.000 so distance while using screen has the relation with refractive error. Distance while reading has the same relation with RE having significant p-value (0.000). A similar study in Chinese children showed significance for near work or distance while reading and using digital devices [21]. The identification of close reading distance and continuous reading as possible risk factors for refractive error may have important public health significance. Given the widespread emphasis on reading and conscientious study habits in childhood, health promotion messages could encourage children to read with the book at a further distance and to take breaks between periods of continuous reading.

Relation of symptoms (blurring of vision, double vision, irritation in eyes, inability to focus, headache) with refractive errors is also considered in our study. 47 students had complained of blurring of vision and 25/47 (47.2%) students were diagnosed with the refractive error while 22/47(19.1%) students didn't get the refractive error. Its p-value is 0.000 which is significant so, blurring of vision has the relation with refractive error.

Similarly, complain of double vision was found in 8 students and after a check-up, it was concluded that 6/8(11.7%) students got the error while 2/8(1.7%) students remain healthy. By getting the p-value of 0.013 which is significant it was concluded that doubling of vision also has the relation with refractive error. 26/56(49.1%) students had complained of irritation in eyes had the refractive error while 30/56 (26.1%) students had no RE. Its calculated p-value is 0.005 which is significant and found to have the relation with refractive error. A similar study was conducted in district Gujrat in

which relation of symptoms (blurring of vision, double vision, irritation in eyes, headache) was observed with RE.

But in our study, the headache has no relation with refractive error as its p-value is 0.563 which is insignificant although it is the commonest complaint worldwide. The reason might be curtailment to a single madrassa or limitation of the sample.

The study was not without limitations. Other refractive errors were not explored and girls students weren't accessed. Moreover, this study involves only single madrassa, thus the generalization of findings to other madrassas may be limited. Despite these and certain resource constraints, our study has provided much-needed information regarding the prevalence of refractive error among madrassa students. As these findings are limited to only a single madrassa, we recommend that further exploration of the role of such modifiable risk factors be conducted in school going children or other population especially those attending the madrassa as such schools are overlooked by the Goverments even in the provision of school health services.

CONCLUSION AND RECOMMENDATIONS:

Uncorrected refractive errors are the commonest cause of visual impairment in all groups of society. These have lifelong impact on the lives of people particularly, children of poor socioeconomic background falling in age group 5-15 years. Madrassas not only are neglected part of parallel education but also are deprived of regular health services. Considering this, the following crosssectional study was carried out on 168 students of madrassas in district Sialkot, to find out the prevalence of different refractive errors and their related factors.

The result of study showed that the total prevalence of refractive errors among madrassa students was 53/168 (31.5%). Out of which previously known were 27/53(50.9%) and newly diagnosed were 26/53(49.1%). Among refractive errors myopia was the most prevalent 43/53(81.1%) followed by Hyperopia 4/53(7.6%) and astigmatism 6/53(11.3%). The students age ≥ 13 years, positive family history and years of madrassa schooling(> 1 year) were found to be significantly related to prevalence of RE. Maternal education had a protective factor against prevalence of refractive errors. Similar role was found for working mothers. Among personal habits insufficient illumination during indoor activities and reading distance ≤ 25 cm were also found to be significantly related. No relation was found with screen time although 55.9% used screen more than 30 minutes per day. Eye irritation, diplopia, blurring of vision were found to be significantly related to refractive errors.

A high prevalence of RE among madrassa student is in indicative of the tip of the ice berg which would unearth the appalling scenario. The study results show lack of screening and poor health services in madrassas, hence, quantifying the need to increase awareness and proper screening among the students who are studying in a marginalized parallel school system and already belong to the lower social strata of the society.

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11 40

(Questionnaire)
"PREVALENCE OF REFRACTIVE ERRORS AMONG MADRASSA CHILDREN"
Dte: Serial no:
Name of interviewer
<u>Socio-demographic profile:</u>
2 A gay 2 Conders Mala
4 School:
5 Veers of schooling: Dev scholar Hostellite
6 Vears of Madrassa schooling.
Parents Educational Status
7 Father's educational status
Illiterate Undermetric Under graduate Graduate above graduate
8. Mother's equicational status
Illiterate Undermetric Under graduate Graduate above graduate
Parents' occupation status
9. Father's occupational status
Unemployed Govt/Private job unskilled worker
Professional
10.Mother's occupational status
Housewife works inside the house works outside the house
11.Type of family : Extended Nuclear
12.Family income from all sourcesPKR/month
Place of residence Rural Semi-urban Urban
Personal Habits/History:
1.Total sleeping hours:
2.Total time spent in studying:in hours /day
3. Total time spent in outdoor recreational activities:in hours/day
4. Total time spent indoor recreational activities: in hours/day
5.Total screen time:in hours/day
6.Do you think that there is sufficient illumination in the (class room) while studying?
Yes No
7.Do you think that there is sufficient illumination in (class room) indoor activities?
Yes No
8. How much distance do you keep from text while reading?
Sufficient (atleast two feet) Close (Less than two feet)
9. How much distance do you keep from screen?
Sufficient Close
Refractive History
10.Did you ever get your eyes examined?
Yes No
11.Were you ever diagnosed with refractive errors?
Yes No
If yes then what did they tell you?
12.Does any one else in the family have similar problem?
Yes No
13. Do' you 'get
Headache Irritation in eyes Blurring of vision Double vision

Annexure 1

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Examination

	RIGHT			LE	FT	
Visual acuity:						
Pinhole vision:						
Refraction:						1
	SPHERE		CYLINDER	AXIS	5	V.A.
RIGHT						
LEFT						
DIAGNOSIS:						
Refractive error:		Yes		No		
IF YES:-						
Myopia		Hypero	opia		Astigmatism	
• •			-		-	