Prevalence of Refractive Error in Mentally Retarded Students of Kathmandu Valley.

A Research Work Submitted to
Nepal Health Research Council
Ramshah Path, Kathmandu, Nepal

Submitted by:
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Done under the Guidence of
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and
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CERTIFICATE

This project work entitled the ***"Prevalence of Refractive Error in Mentally Retarded Students of Kathmandu Valley"*** submitted by Rabindra Ghising to the faculty of B. P. Koirala Lions Center for Ophthalmic Studies, Institute Of Medicine, Tribhuvan University, in partial fulfillment of requirement for the degree of Bachelor of Optometry (B. Optom.) was conducted under my guidance and supervision.

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CERTIFICATE

This is to certify that the work of Rabindra Ghising on ***"Prevalence of Refractive Error on Mentally Retarded Students of Kathmandu Valley"*** which is being presented by him as a "Project Work" for B.Optom. was conducted at BP Koirala Lions Center for Ophthalmic Studies under my supervision and guidance.

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CERTIFICATE

This project work, submitted to the faculty of B. P. Koirala Lions Center For Ophthalmic Studies, Institute Of Medicine, Tribhuvan University, in partial fulfillment of requirements for the degree of Bachelor of Optometry (B.Optom) was conducted under my supervision and guidance at BPKLCOS.

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Mr. Rabindra Ghising
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Introduction

INTRODUCTION

About 10% of the population in the Nepal is suffering from some form of disability. Those disables are mainly divided into four divisions: Blind (and Low Vision), Hearing Impairment, Physical handicap, and Mental Retardation[1]. Among these four groups, Mentally Retarded disable is supposed to be more.

Mental retardation also known as Mentally handicap, mental impairment, translated into Nepali, as "SUSTA MANASTHITI" which means a delay or incomplete or insufficient development of mental capacities and associated behavioral abnormalities in comparison to normal ones of the same age and its prevalence in the world is 2.5% to 3.0% of the total population[2]. Nearly three fourth of such cases are mildly handicapped and about 4 per 1000 (0.4%) of general population are more severely handicapped with an IQ below 50[3]. In Nepal "Merinol fathers project" had done a survey in 1989 for the prevalence of mentally retarded population in which they found about 4.06% (at that time 720,000 people) suffering from mental retardation. Among them 40% were less than 14 years of age[1].

Many of the causes of the mental retardation can be prevented. The most common causes in Nepal include: Diseases such as meningitis, rubella, malaria etc.; genetic birth defects, iodine deficiency, accidents, lead poisoning, lack of environmental situation, lack of early intervention, malnutrition and unsafe delivery.

In an analysis done by UNICEF and HMG Nepal, National Planing Commission at 2001 February, it was found that inborn disability (53.90%), diseases (35.30%), accidents (4.90%), unknown (1.90%), others (3.90%) [26] were the cause of MR.

American Association on Mental Retardation (AAMR) has categorized mental retardation in four groups which is as follows[2]:

Types	IQ Range
Mild (Educable) Mental Retardation	70 - 51
Moderate (Trainable) Mental Retardation	50 - 36
Severe Mental Retardation	35 - 21
Profound Mental Retardation	20 - 0

The IQ level of 71 to 90 is designated borderline intelligence and is not included in mental handicap.

In the physiologically normal eye, when the accommodation is in the relaxed state the parallel rays of light converge to focus on the retina to form clear image. This ideal optical condition is known as emmetropia. Its attainment depends on co-ordinated growth of the ocular tissues that includes axial length, corneal curvature, lens curvature and lens thickness. Any mismatch between power of refractive component and axial separation gives rise to refractive error. Only a single millimeter change in curvature of cornea changes refractive power by 6.00D and 1mm change in axial length changes the refractive power by 3.00D[5]. As the mental retardation is developmental disorder, there may be mal-development of the ocular tissues responsible for development of refractive error.

To understand the development of the refractive error it is necessary to know the ocular growth. According to Zadnick the eye is approximately 17mm long at birth. From birth to 6 years of age, the eye will grow by around 5mm; will lose 4D of corneal power and 20D of lenticular power[6]. In the general population, there is preponderance of emmetropes and the prevalence of acquired myopia is only 2% by the age of 6 Years. During the

following 8 years, the prevalence of myopia increases by more than seven folds in physiologically normal eye[6].

In a study conducted in the three government schools of Kathmandu valley, out of 1100 children, 11% of them were found to have ocular morbidity. Among that the commonest type was refractive error (8.1%)[27]. As the mental retardation is a developmental disorder and refractive error can develop by ocular mal-development, high percentage of refractive error could be found in mentally retarded students, which has never been explored in Nepal.

Prevalence of refractive error not only varies with age but also in different societies that is partly associated with genetic background, nature of the work and environment; place of residency and also with the mental status. In a study done in USA by B. Levy in mentally retarded adults, he had revealed a higher frequency of ocular anomalies of all types than typical of a group of nonretarded subjects of the same age[14]. A similar kind of study done by J. A. Polcar had also found a higher incidence of refractive error and eye diseases in the mentally retarded population[15]. Around 4.06% of the total Nepalese population is mentally retarded; this covers a large number of the total population. The government as well as other concerned authorities seems to be neglecting this group of population. So, this is peak time to conduct this kind of research, which supports mentally retarded people. Though this research seems to be of small scale, this will be a milestone as well as a first pioneer helping hand to this population. In the recent years there were many researches done abroad and which directly or indirectly help the mentally retarded people.

Due to the negligence of the responsible persons, who have to care these mentally retarded population, the health conditions as well as the level of the mental retardation is deteriorating day by day. In mentally retarded people, vision is more crucial because the things seen are more memorable than that is heard. In 1995, Heller K.W., Alberto P.A., and Romski M. A. checked the capacity of memory of mentally retarded children in different senses by using three different cues; first object and speech cues, second movement and speech cues and third speech cues only. They found that object and speech cues, and movement and speech cues, which need vision, were more memorable than the speech alone[5]. This study proves that vision is very important for mentally retarded population.

Childhood mental retardation should not be over looked because 40% of the total mental retardation are of below 14 years and the country would loose more of the productive years in terms of work and economy. If these mentally retarded children have poor vision due to uncorrected refractive error on top of mental retardation, they could not be well educated to develop skills for their better living. It is because; vision is the best sense than hearing and speech. So, correction of poor vision of these children in time will definitely open up new horizon in their learning period.

There are many social organizations providing various kinds of services to the person with mental retardation. These institutions provide education, vocational training and rehabilitation services to them. There are altogether 38 schools and training centers in the Nepal. There are seven training centers including schools in the Kathmandu, 2 in Bhaktapur and 1 in Lalitpur[8]. All of these centers should know the importance of visual function and should give training by utilizing more visual function.

STATEMENT OF PROBLEM

Mental retardation is seen all over the World. They are truly universal. Mental and behavioral disorders are found in all people of all regions, all countries and all societies. But the problem varies from country to country, region to region and society to society. However, the problem of MR in developed countries are not expected to have as much as social impact as do in developing countries due to their higher facilities in healthcare service and also due to coverage by insurance and social attitudes. They educate or train and rehabilitate the person with mental retardation for their independence.

In South-Asia, for centuries, handicapped people have lived their life, born their impairments, coped with their disabilities, and overcome or adapted to negative attitudes of society. The scenario has not changed much even in the brick of the 21st century. There are many rural communities that still consider disabilities as a curse of god and try to ignore the disabled individual thinking that the spell will be transferred to them.

In developing countries like Nepal, having MR people will directly affect the social as well as economical status of the nation. There will be direct loss of working manpower and will have economical burden not just to the family members but also to the nation. If they are not trained properly for their daily living activities, then they need one person for help to live their life.

In Nepal few of the mentally retarded people come for the health services and go to the welfare center for the education, training and rehabilitation. Most people consult a

traditional healer. The attitude of the community towards a person with mental retardation is very negative. They know it as a mental illness but not as a condition of disability. Due to lack of education and health awareness people in most part of Nepal believe that MR occurs as a result of his or her misdeeds during previous life. Therefore the person's family may feel ashamed and other people may fear, suspect or reject the person. Those people are often teased or laughed at. Sometimes they are even beaten because of their strange behavior. All of these problems are due to the lack of education and awareness.

MR is frequently associated with visual disabilities, which will further worsen the status of the MR person. Though eye is most important for the mentally retarded people, the responsible person doesn't know it. Due to the lack of proper vision mentally retarded people are getting into more problems and MR lead a very difficult life. In spite of being many schools, training centers and rehabilitation centers the educators are not training mentally retarded people in a well manner due to the impairment of vision of mentally retarded people or due to the lack of knowledge of importance of vision trainers. If only we can improve in their visual status, they will be able to lead their life in a better manner.

RATIONAL

There is no doubt the vision is the most important gift of god and the good vision enables the person for betterment of his development in all aspect of his life. It is said, ***"Eye is the Window of the World"***. This is more applicable for mentally retarded population. Vision is one of the best senses, which can help them for better learning to uplift their living status. However, most of them have poor vision mostly due to refractive error. Simple correction with glasses can improve their vision that can be utilised by both the trainer to teach them for better rehabilitation and the mentally retarded people for better learning.

As mentioned above, the good vision enables mentally retarded students to learn better than that with uncorrected poor vision. The better learning increases their skills to enable them to earn their living by themselves. So they can be helping hand for national development rather than burden. This research is first of its kind in Nepal which evaluate the prevalence of refractive error in mentally retarded and give subtle data about the number of students with poor vision due to refractive error alone So, the result will provide not only the baseline data for further research works in this field but also the result can insist to formulate a new strategy to tackle the refractive error on time and give them clear vision.

Research Questions

&

Objectives

RESEARCH QUESTIONS

1. What is the prevalence of refractive error among mentally retarded students?
2. What is the visual acuity before correction and after correction of refractive error?
3. What are the other ocular associations with mentally retarded students?

OBJECTIVES

General:

* To find out the prevalence of refractive error in mentally retarded students in Nepal.

Specific:

1) To find out the pattern of refractive error found among mentally retarded students
2) To identify the commonest type of refractive error among the ametropic students.
3) To find out the amount of refractive error among the ametropic students.
4) To find out the distribution of refractive error according to age and sex of MR students.
5) To find out the common associated ocular problems with mentally retarded students.
6) To find out range of the best corrected visual acuity.
7) To find out the causes for the non-improvement of visual acuity.

Operational Definition

OPERATIONAL DEFFINITIONS:

Prevalence: total number of cases at a given point of time or over a period of time in a given population.

Myopia: the condition in which, with accommodation relaxed, parallel rays of light converge to a focus in front of the retina.

Hypermetropia: the condition in which, with accommodation relaxed, parallel rays of light converge to a focus behind the retina.

Astigmatism: a refractive condition in which the eye's optical system is incapable of forming a point image for a point object due to differ in refractive power of various meridians.

Emmetropia: the normal refractive condition of the eye in which, with accommodation relaxed, parallel rays of light converge to a sharp focus on the retina.

Ametropia: a refractive condition where parallel rays of light fail to converge on retina when accommodation is at rest.

Mental Retardation: means a delay or incomplete development of mental capacities and associated behavioral abnormalities in comparison to normal ones of the same age.

Screening: a search for unrecognized diseases or defects by means of rapidly applied tests, examination or other procedures in apparently healthy individuals.

Literature Review

LITERATURE REVIEW

Haugen OH, Aasved H, Bertelsen T. could perform retinoscopy in 342 eyes of 182 patients in a population of 212 mentally retarded. Hypermetropia of +5 or more was encountered in 20 eyes (6.0%), while 26 (7.8%) had myopia of -5 or more. The most striking finding was a high number of severe astigmatism, cylindrical power of -3.25 or more being present in 29 eyes (8.7%)[9].

In a study done by Bothe N, Lieb B, Schafer WD., they found 1) Optic atrophy was the leading cause of visual impairment (24%) followed by cataract and retinopathy of prematurity (both found in 17%), malformations of the anterior segment (12%), cortical amblyopia (8%) and refractive error (6%). Strabismus was an additional finding in 38% of the children often associated with nystagmus. And 2) Visual acuity improved in 30% of cases of cortical amblyopia, in 40% of refractive errors and in 30% of optic atrophy.[10]

Prokesova V, Kriz S, Berg L. and Halvorsen I. had screened 221 patients, ranging in age from six to 81, The screening showed an alarming incidence of eye disease in this group. Only 44 patients had completely normal eye status without errors of refraction. 40 patients had errors of refraction only. 129 had one or more eye anomalies or diseases. There was a large incidence of cataract (52 cases), keratoconus (21 cases), strabismus (59 cases) and conjunctivitis or blepharitis (17 cases). [11]

In the study done by Evenhuis HM, Theunissen M, Denkers I, Verschuure H and Kemme H., they found that the prevalences of hearing and visual impairment were 21% and 4%, respectively[12]

L. Jacobson examined of 228 mentally retarded adults and revealed that every fourth person in the group had a considerable visual handicap. More than half of the examined had one or more ocular disorders. Considerable refractive errors were found in 54 of the examined.[13]

Levy B. clinically examined 298 mentally retarded adults and he also revealed a higher frequency of ocular anomalies of all types than is typical of a group of nonretarded subjects of the same age.[14]

JA. Polcar have found a higher incidence of refractive error and eye disease in the mentally retarded population.[15]

In Korea, Kim JH, Hwang JM, Kim HJ and Yu YS examined 123 Korean children with Down's syndrome between 6 months and 14 years of age for ocular findings and they found upward slanting of the palpebral fissure (78 patients, 63%), epicanthus (75 patients, 61%), epiblepharon (66 patients, 54%), astigmatism (38 patients, 31%), hyperopia (35 patients, 28%), myopia (31 patients, 25%), strabismus (31 patients, 25%, 18 esotropia and 13 exotropia), nystagmus (27 patients, 22%), nasolacrimal duct obstruction (21 patients, 17%), blepharoconjunctivitis (20 patients, 16%), retinal abnormalities (18 patients, 15%), cataract (four patients, 13%), and glaucoma (one patient, 0.8%). Brushfield spots and keratoconus were not found.[16]

Warburg 837 moderately, severely or profoundly intellectually impaired (ID) examined with picture wall chart, VA 0.3-> or =0.10 was found in 10.8%, severe low vision in 1.2% (VA <0.10-> or =0.05), and blindness (VA<0.05) in 3.8%. Poor near vision (<0.3) was present in 19%.The most frequent eye disorders were optic atrophy, high myopia, cataract, and keratoconus. Refraction was assessed in 710 persons (85%), the most prevalent cause of visual impairment was uncorrected ametropia. Hypermetropia of >+1.50 was found in 151 of 710 subjects (21%), and spectacles were used by 106 (15%); myopia <-1.0 was present in 213 individuals (30%), 95 persons (13%) had lenses <-1.0.[17]

Mwanza JC, Nkidiaka CM, Kayembe DL, Maillet CY, Mukau EJ and Tuela MR. examined seventy-three institutionalized mentally retarded subjects (41 boys and 32 girls) aged 5 to 19 years (mean: 11.5 years) ophthalmologically. Ophthalmologic abnormalities were found in 60.2% of the subjects. Eyelid abnormalities accounted for 21.7%, fundus abnormalities for 21.6%, refractive errors for 15% and ocular motility disorders for 13.6%. Taken separately, optic atrophy (16.4%) was the most frequent disorder, followed by refractive errors (15%), hypertelorism (12.3%), epicanthus (10.9%) and nystagmus (8.2%). Strabismus and mongoloid obliquity of lids were seen in 5.4% each other while ptosis was disclosed in 4.2% of cases. Visual acuity tested in 60 subjects revealed that 25 (41.6%) had visual impairment. Of all subjects 10.9% required corrective glasses while 9.6% needed corrective surgery for strabismus and ptosis.[18]

In one study of 120 of mentally retarded children, the prevalence of all eye abnormalities was reported to be 75%.[19]

Edwards, W.C., W. D. Price and B. Weisskopf studied on the "Ocular findings in developmentally handicapped children and found that 48% had defects of the ocular adnexa, 18% had refractive error, and 17% had strabismus[20].

Bankes, L. K. found strabismus in 40%, refractive error in 15% and ocular pathology in 15%.[21]

The first report in the literature of refractive error determination for the mentally retarded was present in 1954 by Kirschen, M. He found more hyperopia in a retarded group than in the normal population of the same age level[22].

Warburg was the first to compare refractive error with IQ. In the Trainable MR group, 45% of eyes fell between +1.00 and -1.00 D; in the Educable MR group, 58% did. In the Trainable MR group, 41% had 2 to 4 D of hyperopia, compared with 29% in the Educable MR group.[23]

Manley and Schulat reported on the refractive status of two groups having IQs of 103 and 41.The normal IQ group had 14% hyperopes and 86% myopes; the retarded group had 76% hyperopes and 24% myopes.[24]

In a study done by Haugen OH, Aasved H. and Bertelsen T., Hypermetropia of +5 or more was 6.0%, while 7.8% had a myopia of -5 or more and astigmatism, cylindrical power of -3.25 or more were8.7%[9].In another study done in Belgium by a group of Mwanza JC, Nkidiaka CM, Kayembe DL, Maillet CY, Mukau EinJ and Tuela MR they

found eye problems were found in 60.2% of the subjects. Eyelid abnormalities accounted for 21.7%, fundus abnormalities for 21.6%, refractive errors for 15% and ocular motility disorders for 13.6% and 41.6% had visual impairment[18].

After studying 1100 children from three schools, Nepal BP, Koirala S, Adhikary S, Sharma AK had reported 11% of our schoolchildren have ocular morbidity, 97% of which is preventable or treatable. Refractive error is the commonest type of ocular morbidity (8.1%). Myopia is the commonest type of refractive error (4.3%) as opposed to hypermetropia (1.3%). 12.4% of children with refractive error have already developed amblyopia. Strabismus is the second commonest type of ocular disability (1.6%)[27].

Kato et al. investigated refractive error distribution in a large sample (1803 eyes). Although all the children had been labeled as mentally deficient, no IQ scores were given. Emmetropic eyes (-0.50 to +0.50D) made upto 52%, hyperopic eyes 13% and myopic eyes 35%. Of the eyes examined, 0.4% exceeded +6.00D and 3.9% exceeded -6.00D[28].

Method & Methodology

METHODS & METHODOLOGY

Research Design:

This study is cross-sectional and descriptive.

Study Period:

The study period was of six months, starting from the 1st of March

Target Population:

All mentally retarded students of Nepal studying in mentally retarded school.

Study population:

Mentally retarded students of Kathmandu valley.

Sampling:

Convenience and Purposive

Inclusion Criteria:

All the students studying in Nirmal Bal-Bikash Bidhylaya, Baneshwor; Jeevan Kalyan Kendra, Kalanki and Jeevan Utthan Kendra, Sitapaila were included in the studies.

Exclusion Criteria:

Students with ocular trauma, Previous Ocular Surgery and those not willing to participate in the study were excluded from the studies.

EXAMINATION PROCEDURE

1. **History Taking:**

Ocular was asked to parents or to teachers as they have seen. It had been mainly included ocular symptoms, medical history, family history, psycho-sociological history, and age of entrance at school and duration of schooling.

2. **Visual Acuity Measurement:**

Distance visual acuity had been first taken monocular and then binocular with the help of Cat Ford Vision Drum, SG chart or Kay Picture Test method but first preference was given to SG chart and then tumbling Kay Picture Test and then only Kay Picture Test method.

3. **External Examination:**

Binocularity, EOM, and Pupil were examined in detail.

4. **Ocular Examination:**

Ocular examination includes slit-lamp examination, IOP measurement and fundus evaluation.

1. Slit-lamp examination:

   Hand held slit-lamp had used to examine the ocular adnexa, (...conj cornea, iris...) the anterior segment and the lens. Any abnormal findings were recorded.

2. IOP measurement:

   IOP was estimated digitally. If any abnormality suspected, the subject was referred to BPKLCOS for applanation.

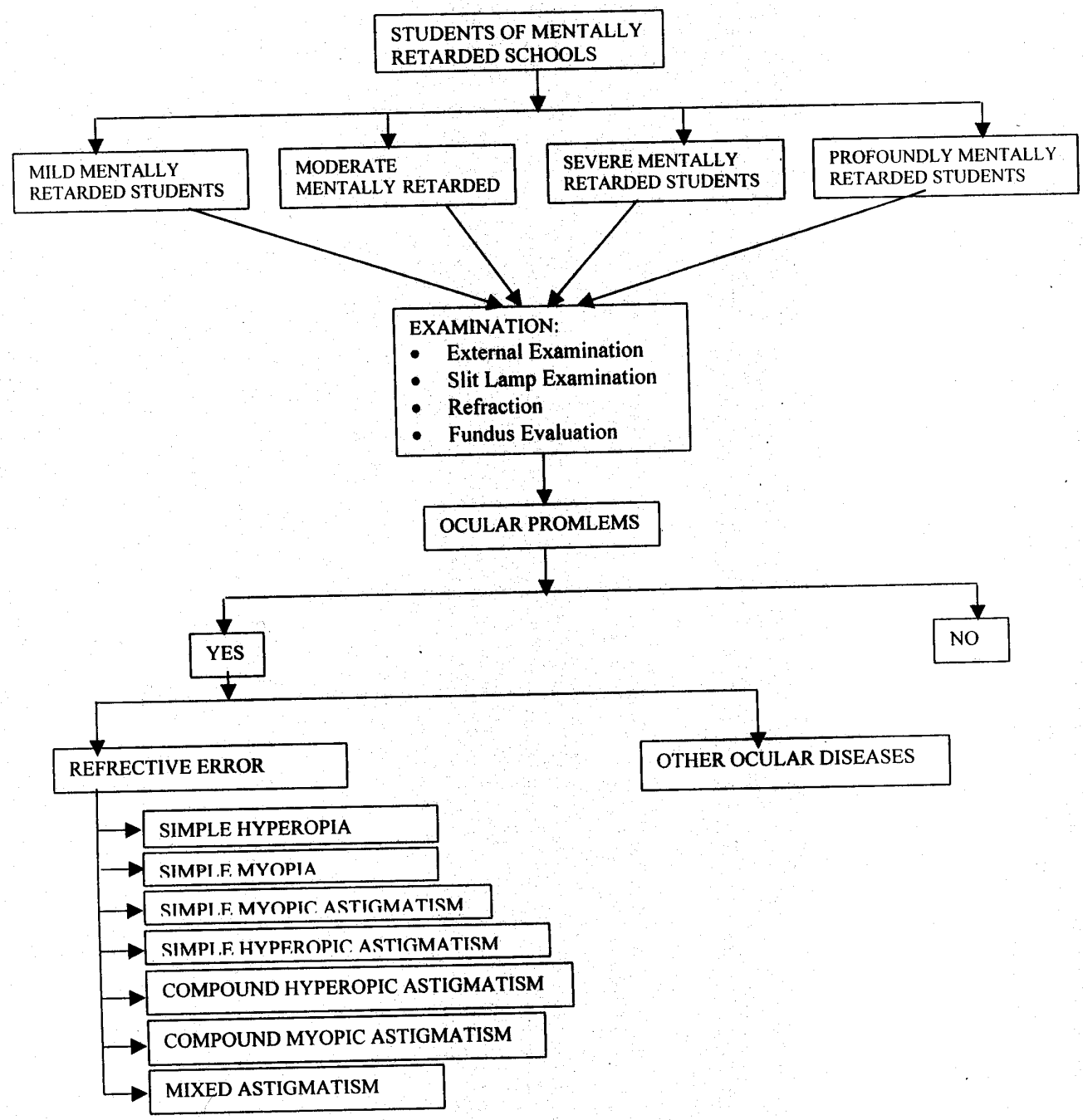
3. Fundus evaluation under mydriasis (FEUM):

FEUM was done with a direct ophthalmoscope to each and every case. All the findings were recorded and if necessary subject were referred to BPKLCOS for further evaluation.

5. **Retinoscopy:**

Standard streak retinoscopy was performed in all subjects in a dark room at working distance of 50cm. In all cases cycloplegic refraction was done and then findings were recorded in the proforma.

CONCEPTUAL FRAMEWORK



Photos

Estimating VA of a MR Student with the Help of Catford Vision Drum

Performing Retinoscopy in a MR student

Performing Internal Ocular Examination with the Help of Ophthalmoscope

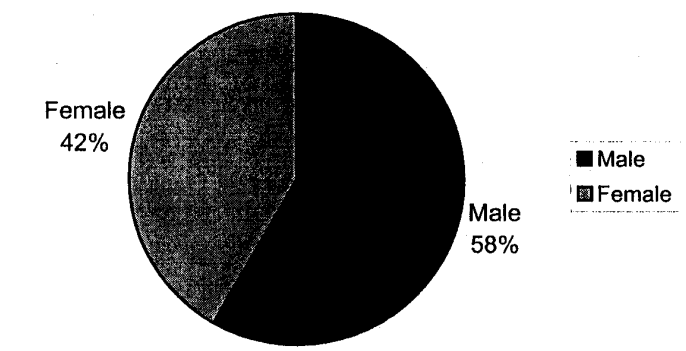
Senior Consultant Ophthalmologist Examining the Fundus of a MR Student with Complicated Findings

Results

RESULTS

The total included MR students were 138 (276 eyes) from three different schools of Katmandu Valley. Among them 80(57.97%) were males and 58(42.03%) were females.

Chart 1: Showing M/F ratio



The MR students belonged to the age group 5 to 40 years. The mean age was 15.06 years with the standard deviation 6.68. Mode age of students was 11 years and median was 13 years.

Table 1: Showing Age & Sex distribution of MR students

Age (Yrs)	Male		Female		Total	
	No.	%	No.	%	No.	%
<6	1	1.25	1	1.72	2	1.45
6-10	22	27.5	14	24.14	36	26.09
11-15	31	38.75	18	31.03	49	35.50
16-20	13	16.25	13	22.41	26	18.84
21-25	8	10	5	8.62	13	9.42
26-30	2	2.5	5	8.62	7	5.07
>30	3	3.75	2	3.45	5	3.62
Total	80	100	58	100	138	100

In the above table, it is clearly seen that the distribution of cases is maximum in the age group of 11-15 years.

Distribution of Refractive Error According to Age and Sex

Out of 138 students, 94 were found to have refractive error accounting for 68.12% out of total. In males, number of cases with refractive error was high in the age group of 6-10 years and 11-15 years but in females it was in the age group of 11-15 years.

Table 2: Showing distribution of refractive error in different age and sex

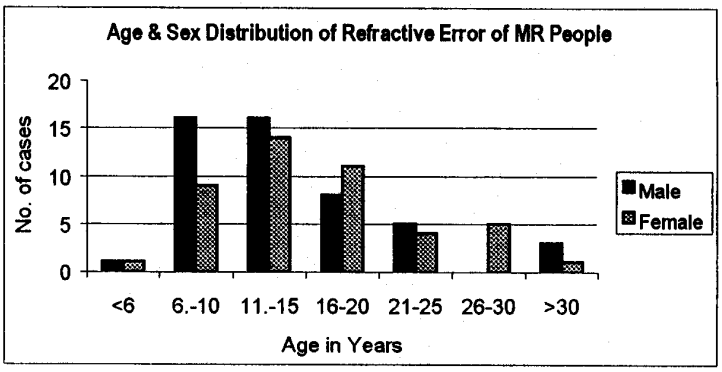
Age (Yrs)	Male		Female		Total	
	No.	%	No.	%	No.	%
<6	1	2.04	1	2.22	2	2.13
6-10	16	32.65	9	20	25	26.59
11-15	16	32.65	14	31.11	30	31.91
16-20	8	16.33	11	24.44	19	20.21
21-25	5	10.20	4	8.89	9	9.57
26-30	0	0	5	11.11	5	5.32
>30	3	6.12	1	2.22	4	4.25
Total	49	100	45	100	94	100

Table 3: Distribution of refractive error in males and females

Status of refractive error	Male	Female
Total cases without refractive error	80	58
Total cases with refractive error	49	45
% of cases with refractive error	61.25	77.59

Though number of cases with refractive error was seen more in males, females showed higher prevalence of refractive error than that of males. In the age group of 26-30 none of the male cases was found with error (chart 2).

Chart 2



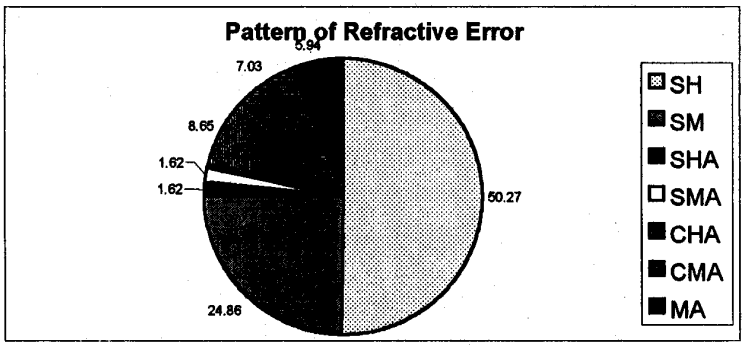
Distribution of Pattern of Refractive Error

Among 138 students (276 eyes), 94 (68.12% eyes) students had refractive error but if we count only more than or equal to +/-1.50D then it comes to 34.42% eyes. Among 34.42% eyes 18.84% had hypermetropia, and 11.23% and 4.35% were myopia and astigmatism respectively.

Table 4: Showing Pattern of Refractive Error

Types of Error	Total No.	%
SH	93	50.27
SM	46	24.86
SHA	3	1.62
SMA	3	1.62
CHA	16	8.65
CMA	13	7.03
MA	11	5.94
Total	185	100

Chart 3

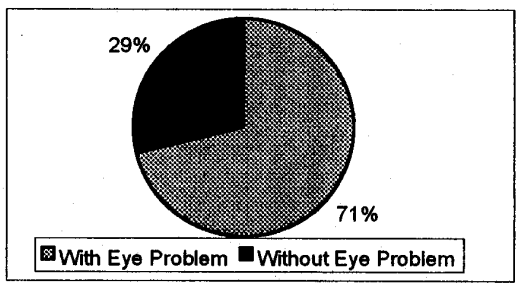


Analysis of the 188 eyes with refractive error revealed that simple hyperopia was the commonest type of refractive error accounting 50.27% of the total. Least prevalent refractive errors were both SHA and SMA (1.62%).

Cases with Eye Problems

Among 138 cases, 98 had eye problem while rest of them have normal ocular findings. Out of 98, 4 cases had eye abnormalities without any refractive error.

Chart 4



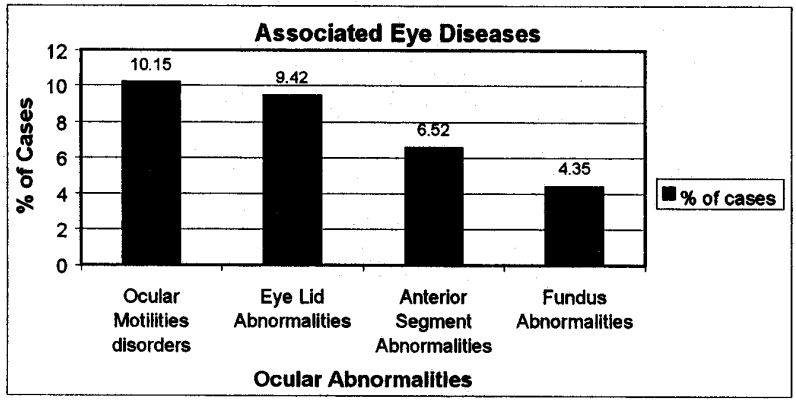
Associated Eye Diseases

Most common abnormalities were lid abnormalities like blepharitis and second most common ocular abnormality was ocular motility disorders like nystagmus and squint.

Table 5: Showing Pattern of Diseases

Abnormalities	No. of cases	% of cases
Ocular Motilities disorders	14	10.15
Eye Lid Abnormalities	13	9.42
Anterior Segment Abnormalities	9	6.52
Fundus Abnormalities	6	4.35
Total	42	30.44

Chart 5



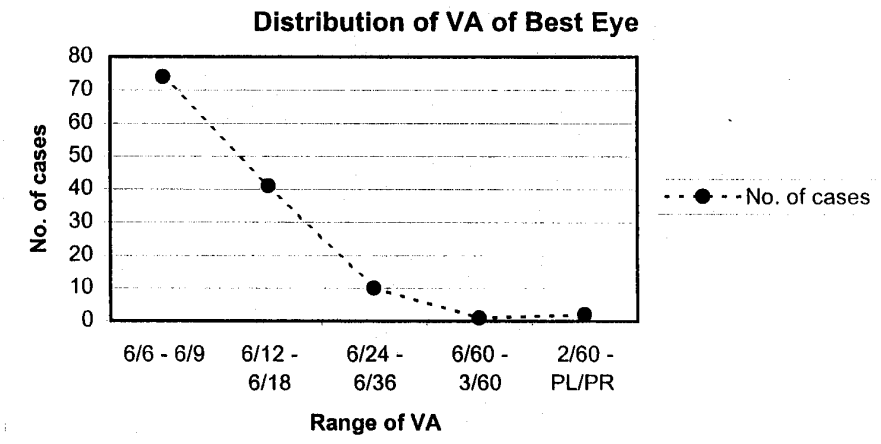
Distribution of Available Visual Acuity

Most of the MR students had visual acuity of 6/6 to 6/9 that accounted for 57.81% of the total. Rest of the students (42.19%) had some amount of visual impairment ranging from mild to severe. None of the student had NPL (does not response to light) in both eyes but one student had NPL in one eyes

Table 6: Showing Range of Available Vision of Best Eye

VA	No. of cases
6/6 - 6/9	74
6/12 - 6/18	41
6/24 - 6/36	10
6/60 - 3/60	1
2/60 - PL/PR	2
NPL	0
Couldn't assess	10

Chart 6



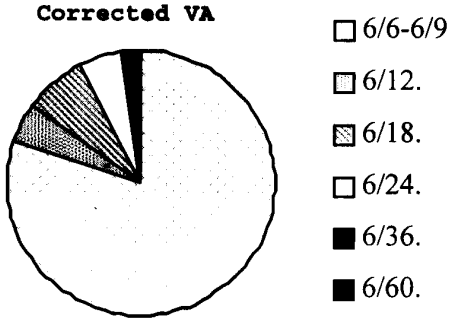
Visual Acuity After Correction

Subjective refraction could do only to 40(28.99%) cases out of total cases. Among them 32 cases had corrected VA of 6/6-6/9 and rest of them had some amount of visual impairment.

Table-7

Range of VA	No	%
6/6-6/9	32	80
6/12.	2	5
6/18.	3	7.5
6/24.	2	5
6/36.	0	0
6/60.	1	2.5
Total	40	100

Chart-7



Causes of Visual Impairment

We could do subjective refraction to only 40 cases so number of cases diagnosed as a visual impairment was very small.

Table-8: Causes of Visual Impairment

Causes of Visual Impairment	No. of cases
Retinal Problems	3
Amblyopia	3
Anterior Segment Abnormalities	2

Discussion

DISCUSSION

This study was carried out in three different Mentally Retarded school of Kathmandu valley where they were mainly trained for their daily living activities and also provide vocational training. One hundred thirty eight students of 5 to 40 years of age were included out of which 57.97% were males and 42.03% were females. Both the eyes of MR students were evaluated to assess the magnitude and type of refractive error and associated ocular abnormalities. The large range of the age (5-40 yrs) and uneven age distribution in MR students shows larger discrepancies in mean, median and mode values with high standard deviation. (Chart1)

Refractive error was found highest in the age group of 11-15 years (31.91%) both in males and in females. This may be due to the highest percentage of cases (35.50%) present in this age group. Refractive error was more in females than in males. (Table 1,2&3 and Chart 2)

Prevalence of refractive error considering eyes was found to be 67.03% of the total cases. This figure is not compatible with the value obtained by the study done by L. Jacobson; who found 23.69% prevalence of considerable refractive error[13]. In this study, higher prevalence of refractive error might be due to the inclusion of low magnitude refractive error i.e. +/-0.25 Ds. As in most of the literature +/-1.50Ds is considered as a baseline refractive power that brings significant change in vision in MR, taking this as a reference point the prevalence of refractive error was found to be 34.425%. Out of this, 18.84% were hyperopic and 11.23% and 4.35% were myopic and astigmatic respectively. This result closely matches with the result obtained from a research conducted by Warburg. He found that hypermetropia of >+1.50D was 21%[17]. (Table 4 & Chart 3)

Generally in normal population (with normal IQ) prevalence of myopia was found to be higher than that of hyperopia but in mentally retarded population it was found just opposite. Manley and Schulat had done a study on the refractive status of two group having IQs of 103 and 41. The normal IQ group had 14% hypermetropias and 86% myopias; the retarded group 76% hypermetropias and 24% myopias[24]. The result of the above mentioned study shows similarity with the result of this study, in which hypermetropia (50.27%) was predominant over myopia (24.86%). (Table 4 & Chart 3)

In this study 71.01% students had suffered from some kind of eye problem, which is similar to the result obtained by Mwanza JC, Nkidiaka CM, Kayembe DL, Maillet CY, Mukau EJ and Tuela MR. They had found 60.2% of subjects had ophthalmic abnormalities[18]. Ocular motility disorders like nystagmus and squint were the most common associated ocular abnormalities accounting 10.15%. This may be due to poor vision and uncorrected refractive error. The second most common abnormalities were eyelid abnormalities accounting 9.42%, which may be due to poor hygiene. (Table 5 and Chart 4&5)

57.81% of the MR students had visual acuity of 6/6 to 6/9. Rest of the students (42.19%) had some amount of visual impairment ranging from mild to severe. In the Study done by Warburg 837 he had found 12% visual impairment and 3.8% blindness17. This big difference may be due to the reliability of the chart used in assessing VA. In this research vision was taken by Catford Vision drum, whose reliability was itself doubtful where as Warburg 837 had used picture wall chart. (Table 6 and Chart 6).

Though the number of cases taken for the evaluation of visual impairment was small, percentage of visually impaired patients(20%) was similar to that of Warburg 837 who had found 15.8%. (Table-7, Chart-7)

Conclussion

&

Recommendation

CONCLUSSION

After completion of this study, following conclusions were drawn based on the results of this study:

- Prevalence of refractive error among the mentally retarded study group was found to be 68.12%.
- Prevalence of those cases having refractive errors above 1.5 DS was 34.43 %.
- Simple hyperopia was the commonest type of refractive error encountered.
- Simple myopic astigmatism and simple hyperopic astigmatism were of the least prevalence.
- In the sex distribution it was observed that female had more refractive error than male.
- The magnitude of ametropia ranged from +10.00D to -16.00D.
- Refractive error was the commonest eye problem seen in this study followed by ocular motility disorder.
- 20% of cases had visual impairment.

RECOMMENDATION

It can be inferred that a maximum number of mentally retarded students had vision problems that could have severe impact on their education, training and daily living activities. Thus regular vision screening should be carried out in the schools for mentally retarded.

Appendix

Appendix 1

PREVALENCE OF REFRACTIVE ERROR IN MENTALLY RETARDED STUDENTS OF KATHMANDU VALLEY

PROFORMA

Name of School ..... Date.....

Name:..... Age/Sex:.....

Ethnic:.....

OCULAR SYMPTOMS: as seen by Guardians or Teachers

Poor vision

Yes☐ No☐

Squint eye

Yes☐ No☐

If yes: By birth (congenital)☐ Acquired☐

RE☐ LE☐ Alternate☐

Previous Glasses

Yes☐ No☐

Others☐

Specify: 1).....

2).....

3).....

EXAMINATIONS

Visual Acuity: Method Used (circle) S-G Test / Kay picture / Catford drum

Eye	Habitual VA
Right	
Left	

Ocular Motility:

Full ☐ Restricted ☐

Cover Test:

Orthophoric ☐

Non-orthophoric: a) phoria ☐ b) Tropia ☐

Lid/Adnexa:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Conjunctiva:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Cornea:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Pupil:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Anterior Chamber:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Iris:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Lens:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Vitreous:

OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Fundus:

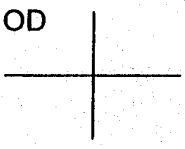
OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Macula:

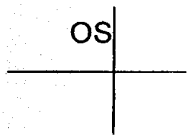
OD	OS
Normal	Normal
Abnormal Specify:.....	Abnormal Specify:.....

Wet Retinoscopy:

OD



OS



REFRACTIVE ERROR

- ☐ Simple Myopia
- ☐ Simple Myopic astigmatism
- ☐ Compd. Myopic Astigmatism
- ☐ Mixed Astigmatism
- ☐ Simple Hyperopia
- ☐ Simple Hyperopic Astigmatism
- ☐ Compd. Hyperopic Astigmatism

IMPRESSION.....

Appendix 2

ABREVIATION

AWMR : Association for the Welfare of Mentally Retarded

MR : Mentally Retarded

IQ : Intelligence quotient

VA : Visual Acuity

PL/PR : Perception of Light/Projection of Light

NPL : No Perception of Light

SH : Simple Hyperopia

SM : Simple Myopia

SHA : Simple Hyperopic Astigmatism

SMA : Simple Myopic Astigmatism

CHA : Compound Hyperopic Astigmatism

CMA : Compound Myopic Astigmatism

MA : Mixed Astigmatism

D : Diopter

EOM : Extra-Ocular Motility

BPKLCOS: B.P. Koirala Lions Center for Ophthalmic Studies

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