

Visually Impaired Children

INTRODUCTION

Senses are said to be the gateway to knowledge. Out of our five sense organs, the sense of sight possesses the most unique advantage of providing knowledge and information of the environment surrounding us in a most comprehensive and suitable way. That is why the knowledge gained through a picture of the object, person or event is said to be hundred times better than its mere description in words (i.e. hearing about it). In case we can have a living actual experience of that object or event through direct contact, then the worth of such information and knowledge gained has no parallel to any type of other media or exposure available for its gaining. Now it is no matter of secret that one can avail such experiences only by banking upon his visual abilities. Unfortunately the children with visual impairment in one way or the other are denied the valuable opportunities of coming into direct contact with the realities of life and environmental surroundings through their sense of sight and may therefore suffer to the extent of requiring special care, provision, education and treatment for their well-being, development and adjustment. In the present chapter, we would be concentrating upon the various issues related to such children.

MEANING AND DEFINITIONS

Visual impairment as an umbrella term, includes all levels of vision loss and thus may represent a continuum from individuals with very poor vision, to individuals who can see light but no shapes, to individuals who have no perception of light at all. As a result of such variance, we may find the use of a number of terms interchangeably to describe children with visual impairment such as visually impaired, visually disabled, visually handicapped, partially sighted children, having low vision,

legally blind and totally blind, etc. Let us try to have a knowledge and understanding of all these terms indicative of one's visual impairment, in one respect or the other through some well known/acknowledged definitions like the following.

1. **Love (1975):** "Visually impaired children are those children who have such marked visual difficulties that even with the best medical and optical care they cannot see well enough to profit by the educational facilities that are provided for children with normal vision" (p. 63).
2. **Barraga (1983):** "A visually handicapped child is one whose visual impairments interfere with his optimal learning and achievement, unless adaptations are made in the methods of presenting learning experiences, the nature of materials used and/or in the learning environment" (p. 25).
3. **Individuals with Disabilities Education Act, USA (I.D.E.A. 1993):** "Visual impairment including blindness means an impairment in vision, that even with correction, adversely affects a child's educational performance. The term includes both partial sight (low vision) and blindness" (34 CFR, Ch. III, Sec 300.7 July 1, 1993).
4. **American Medical Association:** "Blindness is central visual acuity for distance of 20/200 or less in the better eye with correction or, if greater than 20/200, a field of vision not greater than 20 degrees at the widest diameter" (Hatfield, 1975, pp. 3-20).
5. **Rehabilitation Council of India Act 1992:** Visually handicapped means a person who suffers from any of the following conditions, namely:
 - (i) Total absence of light.
 - (ii) Visual acuity not exceeding 20/200 (snellen) in the better eye with the correcting lenses, or
 - (iii) Limitation of the field of vision subtending an angle of 20 degree or worse.

Let us have now a close look at these definitions. All the first three definitions try to define visual impairment/visually impaired children/visual handicapped children/in reference to the impaired conditions, difficulties and deficiencies present in the children sufficient enough for making them different from children with normal vision to the extent of attention, requiring special education provision. In this way, these definitions may be classified and labelled as educational definitions of visual impairment, i.e. emphasizing relationship between vision and learning. However, the fourth and also the last one of the above mentioned definitions provided by American Medical Association and Rehabilitation Council of India Act try to view visual impairments including blindness from the medical and legal angles. Let us try to understand what they convey.

These definitions are primarily based on main components namely visual acuity and field of vision. Vision refers to one's ability to see final details or clearly distinguish forms at varying distances. It is in fact a measure of the refracting power of one's eyes to send light rays to a point of focus on the retina in order to make him able to see things as clear as possible at some specified distance. Normal visual acuity is recorded as 20/20. It does not mean perfect vision. It simply conveys that at

distance of 20 feet, the eye can see what a normally seeing eye should be able to see at that distance. In the phrase "20/20 vision", the top numeral denotes the distance from the letter or symbol on the familiar eye chart, usually the Snellen chart (you must have seen that if you ever had a chance of eye testing with an eye specialist). The bottom numeral indicates the distance from which an individual with normal vision could read the chart letter or symbol. Hence the wording "visual acuity for distance of 20/200 in the better eye with 20/200" in the present definition for labelling one as blind would mean that if Vinod has 20/200 vision with his glasses or contact lenses, he needs to stand at a 20 feet to see what most other normal children in his class can see from 200 feet away. As a general rule "from the norm 20/20" as the bottom number increases, visual acuity decreases.

Field of vision is another criterion that has been used in these definitions for labelling one as blind or visually handicapped. It indicates the entire area one can see at one time without shifting one's gaze. It is reported in degrees. A normal eye in a course of straight gaze is able to see things clearly within a range of approximately 180 degrees. Many individuals having good visual acuity or surely greater than 20/200 maybe able to see things clearly while seeing straight (as viewing them through a narrow tube or tunnel) but are found to have very poor peripheral vision at the outer range of their field of vision. As a result, it may make difficult for them to move around freely from place to place, particularly in crowded or unfamiliar areas. Out of such people whose field of vision is restricted to 20 degrees or less are considered blind or visually impaired by these definitions given by American Medical Association, USA and Rehabilitation Council of India, Act.

Both these above definitions are termed as a legal definition, in the sense that these are mainly employed to label an individual as legally blind for making him eligible to claim a variety of legal, educational and social services and benefits provided by the Government and social welfare agencies.

The definitions labelled as legal definitions, although necessary for providing legal and social services and benefits, are hardly capable to serve the purposes and functions of education and educators. As educators, we are less concerned with the actual measurements of the impaired visual acuity and the field of vision than the functionality of vision, i.e., knowledge of the extent to which a particular child is capable of using his/her remaining vision in an educational setting. It implies that we need a somewhat functional definition of the term visually impaired for serving our educational purposes (i.e., taking educational decisions regarding placement, curriculum, methods of teaching, utilization of assistive and learning devices, etc.).

For serving this purpose the definitions and classification provided by Barraga and Erin (1992, p. 26) may prove quite useful. Let us reproduce it for consideration.

Visually handicapped: The total group of children who require special educational provisions because of visual problems.

Blind: Having either no vision or, almost, light perception (the ability to tell light from dark) but no light projection (the ability to identify the direction from which light comes).

Low vision: Limited distance vision but some useful near vision at a range

of several feet; function varies with light, task, and personal characteristics; adjustments are possibly necessary in lighting, size of print or objects and distance.

The above descriptions given by Barraga and Erin thus tries to put all children requiring special education on account of visual losses or problems into an umbrella term visually handicapped/impaired children and then try to bifurcate them into two blind categories—blind children and children having low vision on the basis of the functionability of their visions on two distinct levels.

The first group labelled as “blind children” represent that group of visually impaired children which in terms of functionability of their vision have no alternative left than using other senses for educational purposes instead of vision. However, they may be able to manage the utilization of their limited vision to supplement the information received from other senses (e.g. auditory and tactile senses) and to render help in doing certain essential tasks (e.g. moving about in the classroom). As a result, in most of the situations these children may be found to make use of Braille (a system of touch) for their reading and writing.

The second group labelled as “children with low vision” represents that group of visually impaired children who are found to make use of vision as a primary source of their learning. They are found capable of utilizing large print/details for their reading and information getting process.

For making the educational requirements of the visually impaired, it seems quite worthwhile to accept the above mentioned classification of the visually impaired children into two broad groups, i.e., blind children and children with low vision. Consequently we would be to make use of the reference of these two groups while paying consideration for the education and welfare of the visually impaired children in the present chapter with clear-cut understanding as follows:

1. *Blind children.* A group of visually impaired children making use of Braille and other non-visual sources for their education. (It may consist of totally and nearly totally blind-children).
2. *Children with low vision.* A group of visually impaired children making use of the residual vision as a primary source of their education. (It may consist of all the low vision and partially blind children like children suffering from the problems, even after correction like dimness of vision, haziness, film over the eye, foggy vision, extreme near or farsightedness, distortion of vision, spots before the eyes, colour distortions, visual field defects, tunnel vision, no peripheral vision, abnormal sensitivity to light or glare, and night blindness, etc).

Our Visual System and Visual Impairments

Operation of our visual system is quite complex. By one or the other reasons, this system may be subjected to various impairments causing serious visual disabilities to the affected individuals. Let us see how it functions and what type of visual impairments may be caused by its dysfunction.

Our visual system mainly consists of three components namely our eyes, optic nerves and brain. The basic function of our eyes is to gather visual information from

the environment and transmit it to the visual centre of the brain through optical nerves for its proper interpretation. The success of the functioning of our visual system may thus depend upon the proper functioning of our eyes, (visual sensory input), optic nerve (carrying sensory message to the brain) and visual centre of the brain (responsible for telling the meaning of what is seen through eyes).

The process of the visual perception of an object lying within our visual field begins with the reception of the light rays reflected from that object by the central part of the retina (a multi-layer sheet of nerve tissue at the back of the eye enable to function like the film in a camera). Optic nerve is attached to the retina. Thus it is from the retina that visual image of the object seen is transmitted through the optic nerve to the brain for its perception (for the interpretation of the visual image).

However before transmission of the visual image to the optic nerve by the retina, the light rays reflected from the object seen are found to travel their path along various structures and substances of our eye gradually bending the light a little bit to produce the ideal image on the retina as depicted in Figure 7.1.

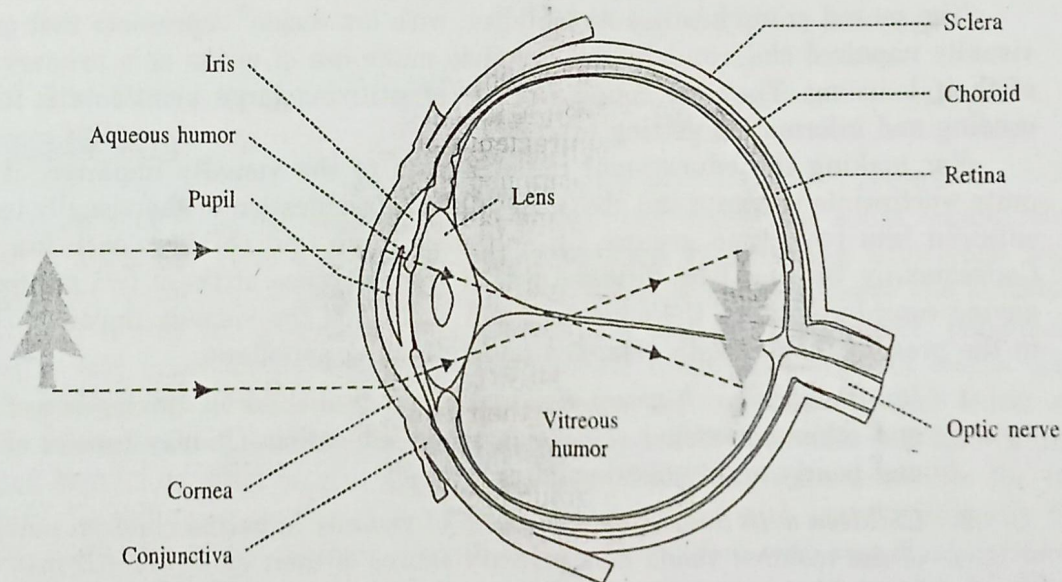


Figure 7.1 Structure and Functioning of the Human Eye.

- (i) Firstly, these are made to pass through the cornea (a curved transparent membrane that protects the eye).
- (ii) From cornea, these light rays pass through the aqueous humor (a watery substance filled in the front chamber of the eye).
- (iii) Then the light rays pass through the pupil (a circular hole in the center of the iris—the colored position of the eye that expands or contracts depending on the amount of light striking it).
- (iv) Next, the light rays pass through the lens, a transparent elastic structure responsible for refining and changing the focus of the light rays before they pass through the vitreous humor (a jelly like substance that fills most of the eye's interior).

- (v) The light rays finally get focused on the retina for providing clear image of the object seen.

For the clear perception of an object, it becomes therefore, quite essential that a clear and sharp focused image should be formed on the retina. It depends upon the proper functions performed by all the earlier mentioned different structures responsible for reflecting light to arrive on the retina. Any defect and disturbance related to these structures may give birth to various types of visual impairments like the following:

1. *Myopia (near sightedness)*. It represents a refractive error in which one can see near objects clearly but the objects lying at more distance are either not seen at all or are blurred. It happens when the size of the eye is too larger than normal from front to back resulting into the focusing of the image of the object in front of rather than on retina.
2. *Hyperopia (far sightedness)*. It represents a refractive error in which one feels difficulty in seeing near objects clearly but can focus well on more distant objects. It happens when the size of the eye is too shorter than normal resulting into the focusing of the image of the object behind rather than on the retina.
3. *Astigmatism*. It represents a refractive error caused by the irregularities in the cornea or other surfaces of the eye. Due to such irregularization, objects lying both at the near and far distances may get out of focus resulting into their distorted or blurred vision.
4. *Strabismus (crossed eyes)*. It represents an inability of the individual to focus on the same object with both eyes simultaneously because of an inward or outward deviation of one or both eyes.
5. *Cataract*. It represents a condition or state of cloudiness in the lens of the eye which results into a blurred, distorted or incomplete vision due to the blockage of the light necessary for having a clear vision. In severe cases, the individual may be found to perceive no details at all of the objects seen by him.
6. *Glaucoma*. This impaired condition of the eye is characterized by abnormally excess pressure within the eye due to disturbances or blockages of the fluids that normally circulate within the eye. In case it goes unnoticed and untreated, the excess increased pressure may cause serious damage to the retina and optic nerve resulting into blindness.
7. *Retinitis Pigmentosa (RP)*. It represents a hereditary disease of the eye causing gradual degeneration of the retina. In the beginning it may create difficulty to a child in seeing at night and then may cause him the loss of peripheral vision.
8. *Coloboma*. It represents a congenital condition in which the central and/or peripheral areas of the retina of a new born are found incomplete in their formation. Gradually it may degenerate into serious impairments of the visual field and/or central visual acuity.

9. *Retinopathy of Prematurity (RoP)*. Previously known as retrolental fibroplasia which represents a condition caused by administering high levels of oxygen to at-risk infants. It is known to be resulting into scar tissue formation behind the lens of their eyes leading to visual impairment and often total blindness.
10. *Diabetic retinopathy*. As the name suggests the impairment in the retina, here is caused by the consequences of one's suffering from diabetes (a very common disease of the modern age) available in the form of unusual interference with the blood supply to the retina. Such interference may result into serious vision impairment including total blindness.
11. *Nystagmus*. It represents a muscular defect of the eye in which side to side rapid involuntary movement may cause difficulty in focusing on objects and thus may interfere with the process of having clear vision of these objects. It may often results into dizziness and nausea.
12. *Amblyopea*. It represents a type of muscular defect of the eyes in which we find a loss of vision due to muscle imbalance. The child affected by such disorder falls victim of double vision (two images of the same object). The brain in its attempt to reduce the confusion, tries to repress the vision in one eye, resulting in loss of sight to the unused eye.

CAUSES OF VISUAL IMPAIRMENT OR DISABILITY

The causes regarding the visual impairment and disability of the children lie well within one's heredity endowment as well as socio-psychological and physical environment. The main underlying causes in this respect may be outlined as:

1. The transfer of genes and chromosomes associated with visual impairments to the children from their parents at the time of conception.
2. The carelessness adopted by the pregnant mothers in their diets, malnutrition, use of strong drugs, being affected from chronic diseases and affected with serious accidents and incidents, the abnormal and stressful psyche states, unhealthy living and socio-psychological environmental conditions faced by the mothers during their pregnancy.
3. The mishaps and incidents at the time of birth of the child, pre-mature delivery, effects of anaesthetic agents and instruments used in delivery, infections caused to the children during delivery, etc.
4. Starvation, malnutrition, unhygienic, uncongenial and unfavourable conditions faced by the children in their early years.
5. The ill effects of the infectious diseases like small pox, chickenpox and measles, etc.
6. The diseases of the eye and infection.
7. The deficiency of the vitamins and other nutrition components, essential for maintaining health and well-being of the eyes.
8. The evil effects of fatal diseases like cancer, growth of tumours, skin diseases, typhoid, malaria, etc.

9. The improper postures adopted at the work place and specially at the time of reading and writing.
10. The ill effects of reading, writing and working in the defective and improper light as dim lights, moving lights, quite intensive lights, scorching lights or fast coloured artificial lights. The exposure to electronic devices, radioactive substances and rays specially watching programmes excessively on the T.V. screen and working with computers have added to many problems and defects of the eyes of the children nowadays.
11. The injury and ill effects caused to the eyes with the carelessness adopted in the day-to-day functioning as well as in professional activities.
12. The damage of the eye organs and other organs of the body responsible for proper sensational and perceptual activities through fatal accidents.
13. The ill effects of poisoning and intoxicating substances, alcoholism and drug addiction.
14. The ill effects of the external objects like dust, smoke and pollution, etc.

IDENTIFICATION AND ASSESSMENT

Early intervention is quite essential for dealing with the visual problems of the children and the resulting consequences. As a result, there is a need for proper method of screening the children for the early detection of their visual problems.

Clinical Assessment

By so far the Snellen chart (developed by Hermann Snellen a Dutch Ophthalmologist) is the most common visual screening test. It consists of eight rows of letters (for those who can read alphabets) ranging from large to small or Es (for those who are illiterate or very young). At the time of eye examination, the child is made to sit/stand twenty feet away from the chart and is asked to read the letters with each eye (with the other eye closed). Assessment is based on how accurately the child identifies the letters (or directions of the Es). The serious limitation of using Snellen chart lies in the fact that it can be used to screen for distance vision problems only. In case the child suffers from near vision problem, then we need to resort to some other measures preferably in the form of functional vision assessment.

Functional Vision Assessment

In such type of assessment of one's visual problem attempts are made to assess how well one can use the vision that one possesses. The following types of measures may be adopted for this purpose:

Assessment based on the visual performance

- (i) How well does the child perform on distant vision tasks?
- (ii) How well does the child perform on near vision tasks?

- (iii) How well does the child perform in terms of visual field perception and colour vision?
- (iv) How well does the child perform in terms of travel skills?
- (v) What is overall wrong with the child in terms of his visual ability and progress?

Assessment based on the behavioural symptoms

- (i) Does the child rub his eyes excessively?
- (ii) Does the child hold book close to the eyes or lean down close to the book?
- (iii) Does the child hold book too far from his eyes?
- (iv) Does the child unable to see distant objects (i.e. writing on the black board, map details, etc.) clearly?
- (v) Does the child lose place frequently when reading?
- (vi) Does the child blink his eyes more than usual or becomes irritable when doing close work?
- (vii) Does the child often hit against objects lying ahead or on the side?
- (viii) Does the child shut or covers one eye, tilts head or push his head forward?
- (ix) Does the child stumble over objects or experience difficulty in moving around the class room?
- (x) Does the child squint his eyelids together or get frowned when looking at objects?
- (xi) Does the child feel difficulty in reading or doing the tasks which are close to the eyes?

Assessment based on the appearance symptoms

- (i) Does the child have one eye higher in relation to the other?
- (ii) Does the child have an eye that tends to wander?
- (iii) Are the eyes of the child unable to move smoothly in all directions of gaze?
- (iv) Does the eyes of the child get red frequently?
- (v) Does the child have crossed eyes?
- (vi) Does the eyes of the child water frequently?
- (vii) Does the child's eyes look abnormal (e.g. bulging/too big or too small)?
- (viii) Is there swellings in the eyelids of the child?
- (ix) Do the eyes of the child look red-rimmed or encrusted?

Assessment based on self reporting (complaints made by the child himself)

- (i) Does the child frequently complain of dizziness after reading a passage or completing an assignment involving vision?
- (ii) Does the child frequently complain of headaches or eye infections?
- (iii) Does the child complain that his eyes get hurt in bright light?
- (iv) Does the child complain that his eyes itch, burn or feel scratchy?
- (v) Does the child complain in perceiving the objects, that they look blurred or he has dual images of a single object?

After going through this procedure of assessing the vision and observation of the symptoms of visual impairments (eye problem), the need may be felt for consulting specialists and health personnel like ophthalmologists, optometrists, opticians and orthopedists in carrying out the necessary proper diagnosis and follow-up for the treatment and welfare of the visually impaired children.

EDUCATIONAL PROVISIONS FOR THE VISUALLY IMPAIRED CHILDREN

The visually impaired children on account of their impairments and deficiencies have specific limitation, needs and problems with regard to their adjustments and education quite different from their non-disabled peers. They are so much handicapped in terms of mobility and movements that they can not approach the things around them including travelling independently. The deficiency with regard to the proper functioning of their visual sense organ, a primary and most important means for obtaining information and first hand experiences, make them disabled to learn from the nature, books and similar other visual objects unlike their normal peers. The problem gets more acute and severe depending upon the degree of their visual impairment. Therefore, the education and adjustment of the visually impaired children need special attention and provisions quite different from the children who have normal vision. Let us think about such provisions.

Decision Concerning Educational Placement

Where should the visually impaired children be placed for their education, is a vital decision that needs to be taken cautiously. Actually it is based upon a number of considerations related to the nature and severity of the visual impairments, the types of educational institutions/options available for the education of the visually impaired, the men and material resources available in the nearby or affordable school for the visually impaired children, parents, preference, and their capacity for sending their child to one or other types of schools, etc.

As we know there are two types of institutions available for the exceptional children (including disabled) for regular studies namely normal schools (government or private) and residential schools. For the adjustment and education of the visually impaired in the normal school set-up generally, the following types of placement provisions (at a continuum from least restrictive to most restrictive learning environment) may be made available in these schools depending upon the needs of the situation and resources available.

1. **Regular class placement:** In this set-up visually impaired children are taught along with the normal peers without any discrimination with essential adaptation carried out for communication and mobility.
2. **Itinerant teacher programme:** In this set-up visually impaired children receive most of their school education in irregular classrooms but have additional opportunity to get special instructions individually or in small group from an itinerant teacher. Actually an itinerant teacher works as an instructor, resource person for looking after the educational needs of the