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## Impact of Early Intervention on Concept Development of Children with Visual Impairment

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### **Abstract:**

*Vision is the primary sensory system and the master of all senses. The ability to use vision is very important for independent functioning and in performing most behaviour within each developmental area. Visual impairment has complex effects on the entire development of the child influencing all areas of behaviour and perception. When a mere look brings a lot of information to the sighted child a visually impaired child takes longer time to become aware of his surroundings. Blindness in children can dramatically alter the way they relate. By its very nature, the lack of vision affects the child's relationship with other people, between objects, everything from visual gaze to attention. For children with blindness to move skillfully, efficiently and independently it is necessary for them to develop a variety of concepts. These children, therefore require specific learning opportunities to develop concepts related to position, location and distance from themselves and as related to objects in the environment. Concept development and sensory awareness begin in infancy and continue to develop throughout a child's life. We need to provide activities and opportunities which are rich and varied to help develop concepts and skills. Since concept development reaches into all areas of a child's life, all individuals in that child's life, share common goals in concept development. Concepts are not taught in isolation, but consistently throughout the child's life. Thus an attempt has been made in this study to provide early intervention to instill confidence in the child, thereby encouraging and motivating the child to reach higher goals.*

### **1. Introduction**

Vision is believed to be central in development, allowing children to integrate information and formulate representations. Reaching and movement behaviour is mediated by vision, while social interactions are guided by visually mediated behaviours such as gaze, gesture and facial expressions. Manivannan (2005) states that the loss of sight limits the child's power to understand the environment and in making him reluctant to move about. The simple reason is that his visual loss cannot be substituted and can only be compensated and recommends opportunities to develop concepts through auditory perception, tactual exploration, discrimination and comparison.

Sighted children learn through direct experience with objects and people, and by observing other people interacting with objects and people. Later in their development, they can learn further concepts by viewing pictures and videos of objects, actions and events. Children with visual impairment require specific learning opportunities to develop concepts related to position, location and distance from themselves and as related to objects in the environment (Morgan, 1992). They may also need many opportunities to handle and play with everyday objects (such as spoons, cups, food and clothing) that provide the needed experience.

Early intervention services have a significant impact on the visually impaired infants and toddlers. Since these children will experience challenges in playing, communicating, interacting, learning problem-solving skills, and participating in daily routines and activities, early intervention plays a significant role in preventing and reducing the extent of developmental delays. The child with visual impairment needs to develop a basic understanding of positions (eg- left, right, up, down, etc.). When given the hands-on opportunities they typically learn such concepts very quickly and can apply them in natural, real- life situations easily.

Concept development and sensory awareness begin in infancy and continue to develop throughout a child's life. We need to provide activities and opportunities which are rich and varied to help develop concepts and skills. Since concept development reaches into all areas of a child's life, all individuals in that child's life, and share common goals in concept development. Concepts are not taught in isolation, but consistently throughout the child's life. Early intervention are primarily a pedagogical provision. It is oriented towards the family and its views with the major task of perceiving the children as individuals and helping to place at their disposal a "life environment" that will promote "development". The goal is to prevent the potential consequences of visual impairment in the

cognitive, socio-emotional, communicative and psychomotor domain. This is achieved predominantly through intensive co-operation with parents, the social environment and other professionals engaged in early intervention. Early intervention is a stepping stone for a normal development of visually impaired. Therefore, the present investigation was focused in providing early intervention in concept development to selected blind children.

## 2. Need and Importance of the Study

Every five seconds, one person in the world goes blind. A child goes blind every minute.

Ninety percent of the world's blind people live in developing countries, nine million in India, seven million in Africa and six million in China. (International Council of Ophthalmology, 2004)

There are several estimates about the size of visually disabled population in India with reference to the world situation. The United Nations has estimated that there are 42 million visually impaired people in the world, out of which a million live in India.

Visual impairment is unequally distributed across age groups. More than 82 percent of all people who are blind are 50 years of age and older, although they represent only 19 percent of the world's population. Due to the expected number of years lived in blindness (blind years), childhood blindness remains a significant problem; with an estimated 1.4 million blind children below age 15 years.

On the "World Vision Day" Oct 12, 2002 the Doordarshan National News announced that the number of visually impaired persons in India constitutes 18.6 million.

There are 45 million people who are blind in the world and another 135 million more with significant loss of vision. Eighty percent of blindness is avoidable; 20 percent preventable and 60 percent treatable. Yet the World Health Organization (WHO) estimates that the number of blind and visually impaired will double from 180 million to 360 million by 2020 unless concerted action is taken.

The visually disabled child needs to have a wide variety of common experiences that are typical for young children, such as playing with friends in the backyard, helping with chores around the house and going to a community concert.

The experiences that the child has during his or her early years provide the foundation for literacy and for all other skills that are learned and assigned by them. These children will benefit most from experience when they have an opportunity to participate in them directly.

Concept development and sensory awareness begin in infancy and continue to develop throughout a child's life. We need to provide activities and opportunities which are rich and varied to help develop concepts and skills. Since concept development reaches into all areas of a child's life, all individuals in that child's life, share common goals in concept development. Concepts are not taught in isolation but consistently throughout the child's life.

Early intervention is primarily a pedagogical provision. It is oriented towards the family and its views with the major task of perceiving the children as individuals and helping to place at their disposal a "life environment" that will promote "development". The goal is to prevent the potential consequences of visual impairment in the cognitive, socio-emotional, communicative and psychomotor domain. This is achieved predominantly through intensive co-operation with parents, the social environment and other professionals engaged in early intervention.

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## 3. Objectives of the Study

- To develop a rating scale to assess concept development of blind children
- To study the effectiveness of the Early intervention training on the Concept development of visually impaired children with respect to their age level (2-4 and 5-7 years) and sex.
- To study the significant difference if any in the Concept development components (Body awareness, Spatial awareness, Awareness of comparative terms, Object awareness, Auditory awareness, Time and distance awareness, Life and work skills) among visually impaired children who have undergone early intervention training.

## 4. Hypotheses of the Study

- In order to achieve the objectives of the study, the following hypotheses were formulated. They are given in the form of null hypotheses.
- There is no significant difference among sample before and after training.
- There is no significant difference in the pre and posttest mean scores of component skills namely body awareness, spatial awareness, awareness of comparative terms, object awareness, auditory awareness, time and distance awareness and life and work skills in concept development.
- There is no significant difference of pre and posttest mean scores of component skills in concept development
- There is no significant difference in the parental involvement on concept development
- There is no significant difference in the pre and posttest mean scores of concept development with respect to gender
- There is no significant difference in the posttest mean scores of concept development with respect to gender

## 5. Methodology

The methodology for the present study on "Impact of Early Intervention on Concept Development of Children with Visual Impairment" involved the following major steps:

- Identifying blind children in the age group 2-7 years.
- Assessing concept development among the selected sample.
- Developing concepts among the selected sample – An early intervention approach
- Developing an intervention package for concept development among blind children.

### 5.1. Pretesting the Tool

The rating scale for assessing the concept development was pretested among a sample of five blind children three from the Little Flower Higher Secondary School for the Blind, Chennai and two children from the Govt. Higher Secondary School for the Blind Poonamallee, Chennai. Implementing the rating scale among the selected sample necessitated spending around 100 minutes approximately for each along with the brief orientation on the concepts, establishing rapport, assessing and in recording the data.

### 5.2. Assessment of Concept Development among Selected Sample

For an effective assessment, the investigator created a suitable environment with inclusive arrangements such as appropriate seating, eventual display of materials, well lit and ventilated atmosphere, favouring for child's convenience, after which a rapport between the investigator and the subject was established. Then the investigator conducted the assessment procedure in a sequential manner. The assessment components in the concept development included 100 items are shown in the figure 1 represents awareness of comparative terms, auditory awareness, and objective awareness. Since the children were too young for assessment of all areas on a single day the component areas were split for assessment on two different days with body awareness, spatial awareness and awareness of comparative terms on the first day while object awareness, auditory awareness, time and distance awareness, life and work skills on the second day. Almost 20-25 minutes was required for assessing the concept areas of awareness of comparative terms, object awareness and auditory awareness while body awareness, spatial awareness and life and work skills necessitated only 10 minutes. Familiarity of aspects related to time and distance awareness enable the children to fair much better thereby necessitating less time to assess the same by the investigator. Assessment enabled the investigator to score individual sample on the basis of their performance in the above component areas, providing the score of one for the correct response and zero for non-performance. The investigator used qualitative and quantitative procedures to analyse the data.

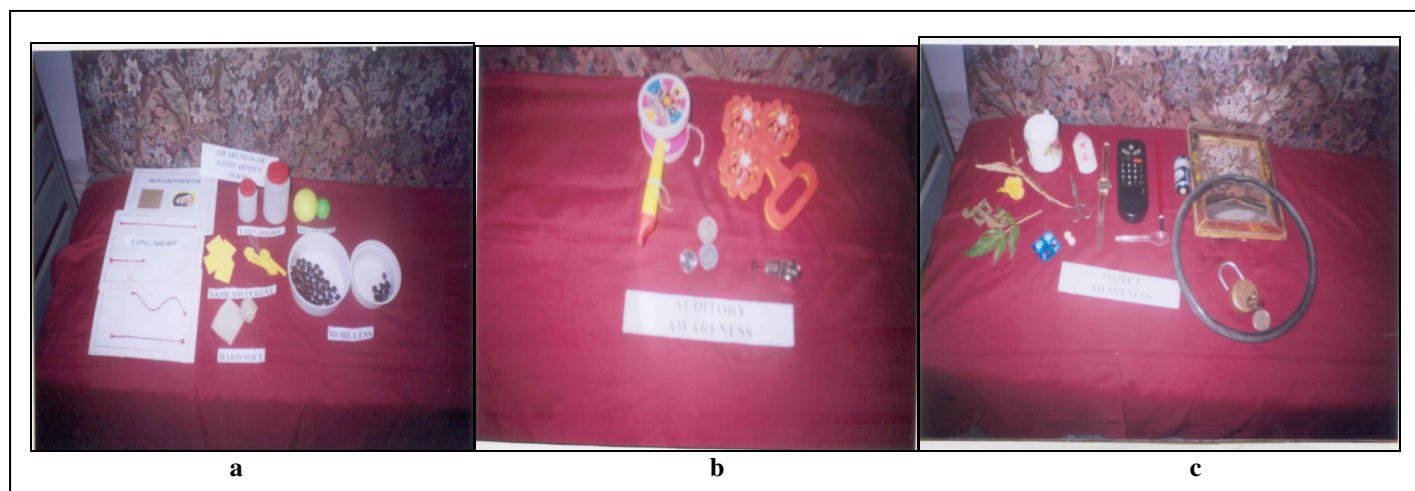


Figure 1: (a) Awareness of comparative terms. (b) Auditory awareness (c) Objective awareness

## 6. Results and Discussion

The results of the study on “Developing Concepts among Blind Children – an Early Intervention Approach”, are discussed under the following heads:

- Background information of selected blind children and
- Impact of early intervention - Pretest and posttest scores on Concept development
- Evaluation of intervention package for concept development

### 6.1. Cause of Disability

The following table.1 and figure.2 gives some of the possible causes that had lead to blindness among the selected sample.

Cause	Number	Percentage
Meningitis	6	20
Xerophthalmia	5	17
Cortical visual impairment	4	13
Retinitis pigmentosa	4	13
Rubella	4	13
Retina blastoma	2	7
Retinal detachment	1	3
Unknown	4	13

Table 1: Cause of blindness among selected sample

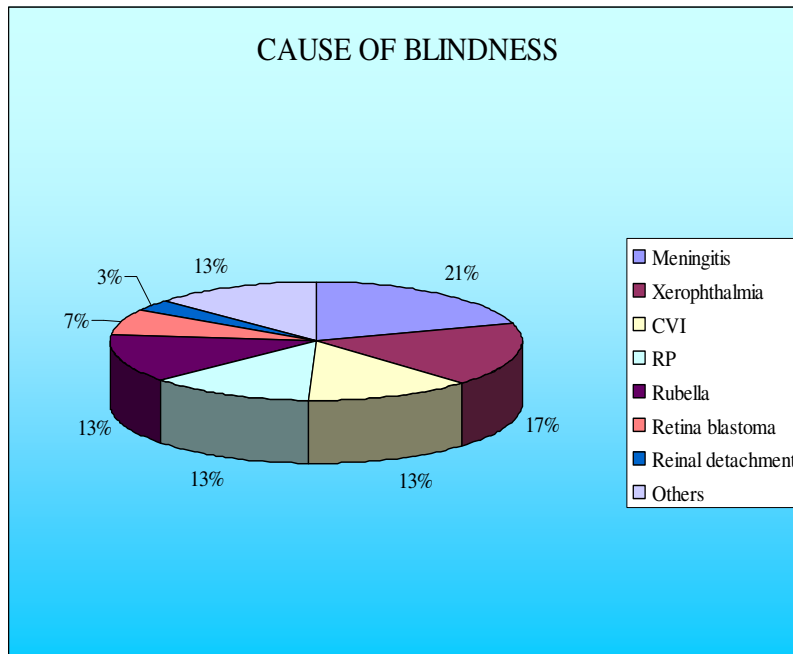


Figure 2: Cause of blindness among selected sample

For almost 20 percent of the selected children Meningitis was the major cause that led to the handicap while for another 17 percent it was due to Xerophthalmia (It is estimated that 250 million children of preschool age in India suffer from Vitamin A deficiency: 350,000 children go blind, Roberts, 2006). Among the selected sample the cause of blindness was also with either Cortical visual impairment, Retinitis pigmentosa or Rubella (13%), less than 10 percent of the sample acquired blindness due to Retina blastoma (7%) and Retinal detachment (3%).

For almost 13 percent of the sample the exact cause that had led to blindness could not be identified since some of these families never attempted medical consultation for the problem.

6.2. Impact of Early Intervention - Pretest and Posttest Scores on Concept Development

In order to assess the concept development of selected children an assessment tool was developed by the investigator covering seven major component areas with hundred sub-items for a maximum score of 100. The areas of concept development of selected children's pretest and posttest scores were analyzed statistically and presented under the following heads. Table.2 gives a mean score and 't' value of the performance of children in all component areas.

Age group	Testing	Mean	SD	't' value
2-4	Pre test	60.83	19.40	14.07**
	Post test	85.42	17.52	
5-7	Pretest	59.78	21.81	10.06**
	Posttest	84.72	15.41	

Table 2: Analysis of overall performance in concept development

\*\*Significant at p < 0.01 level

- From this table it is evident that the co-related ‘t’ value is 14.07 which is significant at 0.01 level. It indicates that the pre and post test mean scores of performance in concept development of blind children in the age group of 2-4 years differs significantly.
- From this Table it is evident that the pre and post test mean scores of performance in concept development of blind children at the age group of 4-7 years differs significantly and the co-related’ value is 10.06 which is significant at 0.01 level.
- It means that there was a significant impact of training on the performance. In the light of this, the null hypothesis stated as “there is no significant difference among sample before and after training” is rejected.
- It may therefore be said that the intervention in the concept development helped in improving the performance of selected blind children both in the age group 2-4 and 5-7 years.

**6.3. Comparison of Mean Scores of Component Skills in Concept Development**

The following table.3 and figure.3 gives a glimpse of mean scores in the component an area of concept development on intervention training among children 2-4 years of age. There is a significant difference between pre and post test scores of all component skills of children belonging to the age group of 2-4 years. Therefore the null hypothesis stated as “there is no significant difference between pre and post scores of all component skills” was rejected. It was found that the mean scores of time and distance concept is comparatively lower. Hence to sum up, that to develop the concept of time and distance multi faceted activities are required.

Components	Mean		SD	t value
	Pretest	Posttest		
Body awareness	14.08	18.17	1.83	7.72
Spatial awareness	6.42	9.33	1.38	7.33
Awareness of comparative terms	4.92	7.92	1.23	8.12
Object awareness	8.33	13.33	1.65	10.49
Auditory awareness	14.92	18.58	2.15	5.92
Time and distance awareness	6.67	9.17	1.51	5.75
Life and work skills	6.08	8.92	1.40	6.99

Table 3: Mean scores in all major component areas of concept development (2-4 years)

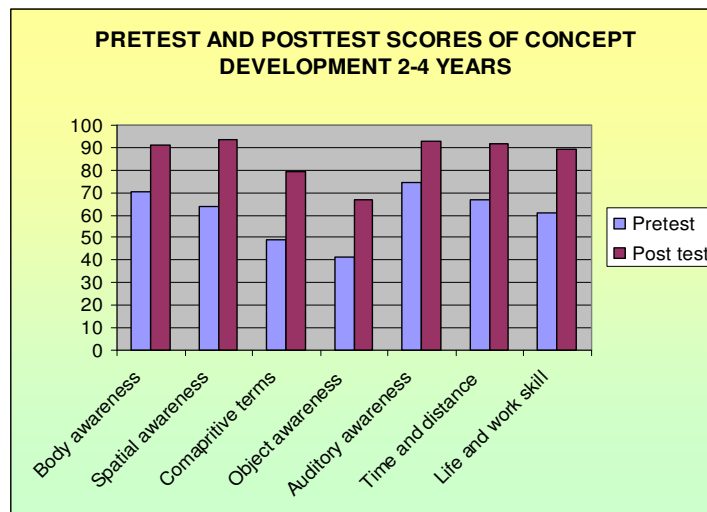


Figure 3: of mean scores in the component an area of concept development on intervention training among children 2-4 years of age

**6.4. Mean Scores in All Major Component Areas**

Table.4 and figure.4 gives a glimpse of mean scores in the component areas of children in 5-7 years of age. There is a significant difference between pre and post test scores of all component skills of children belonging to the age group of 5-7 years. Therefore the null hypothesis stated as “there is no significant difference between pre and post scores of all component skills” was rejected. It was found that the mean scores of time and distance concept is comparatively lower. Hence to sum up, that to develop the concept of time and distance multi faceted activities are required when effectively implemented brought out the needed impact among children.

Component area	Mean		SD	t value
	Pretest	Posttest		
Body awareness	14.67	18.72	1.63	10.58
Spatial awareness	6.06	9.17	1.97	6.71
Awareness of comparative terms	5.22	8.05	1.58	7.60
Object awareness	8.06	13.39	2.40	9.42
Auditory awareness	13.33	18.06	3.14	6.38
Time and distance awareness	6.00	8.89	1.94	6.32
Life and work skills	6.44	8.67	1.40	6.76

Table 4: Mean scores in all major component areas of concept development (5-7 years)

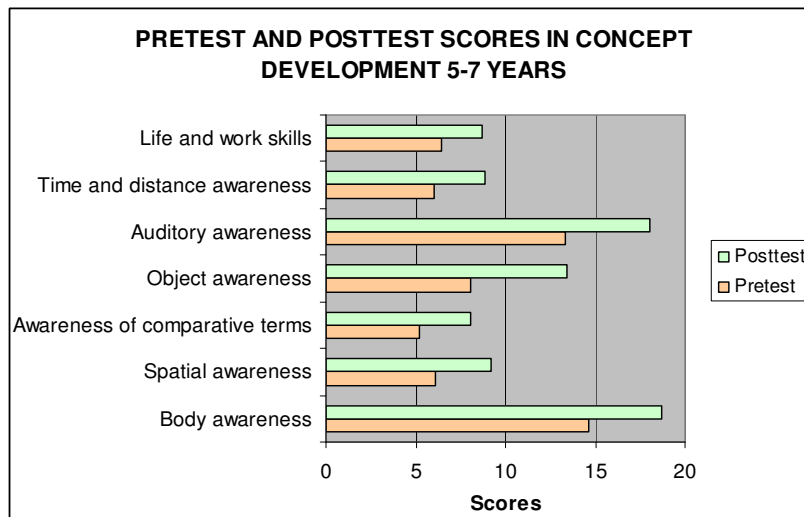


Figure 4: Mean scores in all major component areas of concept development (5-7 years)

## 7. Conclusion

Visual impairment in children can dramatically alter the way they relate. By its very nature, the lack of vision affects the child's relationship with other people, between objects, everything from visual gaze to attention. From the exploration of objects to its location, from language acquisition to effective expression with the gradual acquisition of concepts. Thus an attempt has been made in this study to provide early intervention to instill confidence in the child, thereby encouraging and motivating the child to reach higher goals.

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