



Theoretical Perspective on Efficiency, Comfort and Safety: Physical Environment

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ABSTRACT: Physical environment plays a major role in providing an accessible environment for the special group people by incorporating their special needs. This chapter discusses about the efficiency, safety and comfort of the special group people. High aesthetic quality and good design can inspire, delight, and serve as a catalyst for following one's passions and engaging in social interactions. The environment should be barrier-free and adaptable to meet the needs of all individuals, including the disabled. In truth, the demands of the special group people are similar to those of the general public and everyone feels comfortable with them. The lives of these people become easier by new innovations and they develop a great deal of faith in them.

Keywords: Special group, aesthetic, disabled, environment, barrier-free.

INTRODUCTION

Any physical or mental condition (impairment) that makes it harder for the individual with the condition to engage in particular activities (activity limitation) or engage with the world around them is referred to as a disability (participation restrictions). Disability is defined by Merriam-Webster as a physiological, cognitive, mental, or developmental condition that hinders, interferes with, or restricts a person's capacity to do specific tasks or actions or take part in regular everyday activities and interactions. Developmental, cognitive, mental, intellectual, physical, sensory, or a mix of several disorders or impairments may be present. Disability-causing impairments may be inherited or acquired during the course of a person's lifetime. Frequently, people with impairments are "inevitably excluded from full participation in society". For making the home disabled friendly it is important to take care of their comfort, safety and

physical environment. It is essential that people with disabilities and their caregivers make plans to protect themselves in the event of an emergency or disaster. An accessible home should promote maximum independence for owners or members of the family who are disabled while also providing the maximum possible mobility and comfort for other members of the family and guests.

With today's advancements, there are a lot of home features that can provide comfort, safety and mobility for the disabled persons. There are many different kinds of impairments, including those that impact a person's vision, movement, thinking, memory, understanding, communicating, hearing, mental health, and social interactions. The World Health Organization identifies three aspects of disability: impairment, restrictions on what you can do, and participation limitations. Impairment of a person's physical, psychological, or cognitive abilities; examples include amputation of a limb, visual loss, or memory loss. Limitations on activity, such as trouble hearing, seeing, walking, or solving problems. Constraints on participation in activities that are often part of daily life, such as working, taking part in social and recreational, and receiving medical care and preventative services.

VISUAL IMPAIRMENT

Visual impairment is also known as vision impairment. It is a broad term that is used to refer to any degree of vision loss that affects a person's ability to perform the usual activities of daily life. When someone has vision loss that cannot be restored to normal vision, even with the use of eyeglasses or contact lenses, it is said that they have visual impairment. The World Health Organization (WHO) defines visual impairment as a presenting acuity of less than 6/12 in the better eye.

CAUSES OF VISUAL IMPAIRMENT

Cataracts are the most common cause of blindness. Other disorders that may cause visual problems include age-related macular degeneration, diabetic retinopathy, corneal clouding, childhood blindness and number of infections. Among other things, issues with the brain brought on by a stroke, an early birth, or trauma can also result in visual impairment. This condition is referred to as cortical visual impairment.

PHYSICAL ENVIRONMENT FOR THE VISUAL IMPAIRMENT

Lighting system for the visually impaired: It's a prevalent myth that people with vision problems don't require light or are unaffected by darkness. For most people with vision impairments, lighting is a critical issue. Not everyone who has this condition is entirely blind. Light and dark can be detected to varied degrees by most of people. Maintain adequate lighting in areas such as the hallway, stairwell, and entryway. Glares should not be created by lights because they make most visually impaired people uncomfortable. Windows should be installed in rooms to provide for abundance of natural light. They should, however, have blackout curtains so that the amount of light in the room may be adjusted during the day. Shadow formation should be

avoided whenever possible. Computer and television screens should be kept away from direct sunlight to avoid glare.

Create color contrast around the house: When something stands out against the background, it is easier for people with vision impairments to find it. A visually challenged family member will find it easier to navigate our house if we employ a contrasting colour scheme. Furniture and door knobs should be of a different colour than the door and background. The edges of the stairs should be painted with a contrasting colour so that the person can see where the steps start and estimate the height/depth of the steps. To give the individual access to the kitchen without bumping over the sides, the edges and sink should be painted in a contrasting colour. The chopping board should be light on one side and dark on the other so that the individual can easily cut fruits and vegetables of any colour.

Giving home a tactile effect: People who are blind or visually challenged can use their sense of touch. Doctors also advise a child with a visual handicap to improve their sense of touch, even if the youngster has acceptable vision, because eyesight does not always remain the same throughout one's life. When purchasing furniture, choose for textured upholstery; this will allow a visually impaired individual to distinguish furniture in different rooms based on their texture. A tactile aid system must be installed in the kitchen. Patterned floors, particularly stripes and checks, should be avoided. Mark the switches with embossed letter stickers so that the person can tell what they are just by touching them.

ASSISTIVE TECHNOLOGIES FOR VISUAL IMPAIRED PERSON:

Assistive technology means any item, piece of equipment, or product system that is used to increase, maintain, or improve the functional capabilities of a person with a disability.

Assistive technologies for writing

1. Braille slate and stylus: This writing instrument is inexpensive and simple in its design. It is similar to a pen and paper idea. The Braille dots are produced by punching a hole through one of the two panels of the slate, which is typically comprised of two panels to stabilise the paper.

2. Jot a Dot: This low-tech writing instrument is likewise compact and portable, made of lightweight plastic. It is useful for taking short and quick notes by children.

3. Braille typewriter (Perkins Brailier): It is a small, simple writing device with six keys, one for each of the Braille dots. It comes in a variety of models to meet different purposes. **4. Braille electronic note taker:** It is a portable and small device for storing information with the help of the typewriter or Braille keyboards. The stored information can be accessed through an inbuilt speech synthesizer or Braille or both.

Assistive technologies for reading

- 1. Braille Reading Materials (BRM):** Braille is a tactile system of raised dots that enables students with visual impairment to access the information by touching.
- 2. Audio Format Materials (AFM):** AFM is beneficial for many students with low vision and blind. It allows children to know information or read information. e.g. Digital Accessible Information System-DAISY, Book Port Plus etc.
- 3. Refreshable Braille Display (RBD):** Refreshable Braille Display works with a screen reader and enables the user to read what's on the computer screen by touch on Braille display.
- 4. Reading pen** which provided the audio output of the scanned text.

Assistive technology for activities of daily living (ADL)

- 1. Liquid level sensor:** This specially created tool informs visually challenged pupils by measuring the level of fluid in a mug or glass and producing a sound, a vibration, or both, as the liquid contacts the tip of the tool.
- 2. Talking color detector-** When this device contacts a surface, it can voice distinguish between a ranges of colours.
- 3. Talking watch or alarm clock-** This talking timepiece clearly proclaims the time and functions as an alarm.
- 4. Pill organizer-** People with impaired vision or those who are blind who need to take several prescriptions each day will find this tool especially helpful. It contains a distinct compartment for medicines taken at various times throughout the day. There are available Braille or color-coded box lids.
- 5. Talking money Identifier-** It helps visually impaired individuals to identify money with a voice function. Other tactile note identifier is a money organizer wallet, notex, Note Checker etc

PREVENTION

Visual impairment can be control by the different level of prevention -

1. Primary Prevention
2. Secondary Prevention
3. Tertiary Prevention

1. Primary Prevention - To prevent the disease to ever occurring.

E.g: Vitamin A Deficiency Xerophthalmia (VADX) (Good nutrition), Trachoma (Good water & sanitation), Rubella & measles (Immunization)

2. Secondary Prevention - To prevent loss of vision from established disease

E.g: Cataract (Surgery), Glaucoma (Medical & surgical), Diabetic retinopathy (Medical & laser treatment), Refractive error (Spectacles), Onchocerciasis (Medical treatment- Ivermectin)

3. Tertiary Prevention- Restore vision to a blind person

E.g: Cataract (Surgery), Corneal scarring (Keratoplasty) and Low vision (Low vision aids)

HEARING IMPAIRMENT

Hearing impairment is the difficulty of a person to hear sounds effectively. This could be caused to faulty development, injury, or disease to any element of the hearing process. Normal speech and language development depend on the ability to hear. A youngster picks up language by listening to other people in the family and their environment speaks. According to WHO, hearing impairment is a partial or total inability to hear. There are two subgroups of this disability: deaf and hard - of - hearing. Deaf people are defined as having a 70 dB loss of hearing in both ears for speech frequencies. A person who is hard of hearing has a hearing loss in both ears of 60 dB to 70 dB at speech frequencies. The Individuals with Disabilities Education Act (IDEA) defines a hearing impairment as "an impairment in hearing, whether permanent or variable, that adversely affects a child's performance in educational settings."

CAUSES OF HEARING IMPAIRMENT

Before Birth- The causes of hearing impairment before the birth of child are the family history of childhood deafness or deafness in family members, blood group complications or Rh incompatibility in family, infectious diseases or illnesses during pregnancy and very poor physical condition of the expectant mother. Use of excessive alcohol or nicotine by the expectant mother. Intake of ototoxic drugs. (Ototoxic drugs are drugs that can damage the hearing mechanism if used indiscriminately e.g. Gentamycin, amikacin, quinine preparations etc.) and the excessive exposure to X-rays

During the Birth Process- The causes of hearing impairment during the birth process are the lack of oxygen supply to the new born due to inability to breathe normally resulting in blueness of baby due to various reasons, delayed or feeble birth cry and birth weight of the child less than 1200 grams.

After Birth- The causes of hearing impairment after birth are pre-maturity, deformities of ear, nose, face & throat. Jaundice or high fever immediately after birth. Infectious diseases, intake of antibiotics for a long duration. Injury to the head or ear by accidents, continuous exposure to loud sounds, high blood pressure, diabetes, aging, tumor on the auditory nerve, middle ear infections and ear discharge etc.

PHYSICAL ENVIRONMENT FOR THE HEARING IMPAIRMENT

1. Space and proximity
2. Sensory reach
3. Light and colour
4. Mobility and proximity
5. Acoustics

1. Space and proximity - People, who require eye contact for the entirety of a conversation, as well as those who communicate solely through their hands and facial expressions, demand more space than those who listen. To communicate, sign language uses both hands and facial speech. Lip readers must be able to see the lips they are reading. It is also crucial to consider the room's arrangement.

2. Sensory reach - When a person loses a sense, other senses become more acute. Colors, shadows, and even sounds can aid people with hearing impairments in better understanding and becoming aware of their surroundings. The vibrations of footfalls indicate that someone is approaching around a bend, and there is plenty of glazing to enhance seeing. People who are deaf or hard of hearing utilize shadows to read their surroundings.

3. Light and Color - Light is essential not only for comfort, but also for communication. People can see facial expressions and hand gestures better when colors contrast with skin tones. Furthermore, light must be bright enough to see but not so bright that it causes glare. When conversing, windows must be shaded from above so that the person conversing is not blinded by the sun's glare.

4. Mobility and proximity - When deaf individuals are walking and speaking, they must maintain visual contact with each other and have their hands ready to communicate. Doors open automatically and sidewalks and pathways are large. Avoid using extremely bright surfaces or materials in flooring and furniture that make noise or transfer vibrations when they come into touch.

5. Acoustics – According to Merriam-Webster, acoustics is defined as the science that deals with the production, control, transmission, reception, and effects of sound. Noise is a cause of hearing loss and a key role in the well-being of those who have low hearing thresholds. Hearing aids enhance background noise to levels that are completely distracting when there is noise in the background. Sound waves bounced off hard surfaces generate reverberation, which can be unpleasant and even uncomfortable for people. Reducing reverberation by identifying the absorption level of surrounding materials is the most important aspect of improving the acoustics of indoor spaces. Distributing noise or sound sources, such as machinery or speakers, in a proper manner.

ASSISTIVE TECHNOLOGY FOR THE HEARING IMPAIRMENT

These are special systems which are designed to assist people with hearing impairment for specific purposes such as using telephones, watching/listening to TV, doorbell, alarm clock etc. Generally speaking, they support daily activities involving hearing. They refer to system that enhance only the signal (sound which is useful for the person) and not the noise by transmitting amplified sound directly to the listener with hearing impairment. Transform sound into visual or vibrational signals.

1. Sound Enhancement Technology
 - a) Induction Loop Systems
 - b) Group Hearing Aids
 - c) Frequency Modulated (FM Systems)
 - d) Infrared Systems
2. Television Enhancement Technology
3. Telecommunication Technology

4. Signal/Alerting Technology

1. Sound Enhancement Technology - This system used to assist in the reception of sounds. E.g. Infrared systems, personal and group hardware systems, frequency modulation systems and loop induction systems. In these systems, microphones pick up sound and convert it into another form of energy. An amplifier then increases the intensity of this signal. Lastly a receiver converts the amplified signal back into acoustic energy so that the person with hearing impairment can hear it.

- i) **Induction Loop Systems-** These systems have been installed at ticket booking counters of railway stations in some of the major cities of India. As a result, the deaf person would be able to hear announcements given over the microphones without being bothered by background noise. The listener would need to put his personal hearing aid in the "T" position and wear it. Additionally, at schools for the deaf and hard of hearing, induction loop systems are frequently employed.
- ii) **Group Hearing Aids-** Group Hearing Aids are generally used in classrooms of special schools for children with hearing impairment. The instructor is carrying a microphone. The pupils sitting at their workstations wear earbuds that are given the enhanced signal. A volume adjustment is available on each earphone headset or on the desk. The desks are equipped with microphones so that all of the students can hear what each youngster is saying.
- iii) **Frequency Modulated (FM Systems) -** These systems provide very good sound clarity even in the presence of room noise.
- iv) **Infrared Systems-** In Infrared Systems the sound picked up by the microphone is converted into infrared light waves, which are then dispersed throughout the listening environment.

2. Television Enhancement Technology- It is used to improve auditory perception of a televised signal. Also caption decoding can be done. These include different types of devices. Some of them aim to enhance the listener's experience with sound quality. For this, infrared systems may be employed. Decoders for closed captions are also very helpful because they turn all spoken TV messages into visible text or captions that may be seen on the screen.

3. Telecommunication Technology- This system is used to enhance telephone communication. E. g. Text telephone, built-in portable amplifiers and induction loop systems.

4. Signal/Alerting Technology- It use devices which delivers signal through visual or tactile vibratory means so as to enable hearing impaired person to perceive them. This includes technology to alert persons with hearing impairment to the presence of sound by converting the sound into another form of energy which she/he can perceive. E.g. Alarm clock with vibrators, smoke alarms, door bell alerts and baby cry systems.

PREVENTION OF HEARING IMPAIRMENT

Immunize the adolescent girls and women in child bearing age against Rubella. Ensure good health of the expectant mother; seek health check-ups at regular intervals. A pregnant woman should avoid interacting with someone who has an infectious disease. Ensure that the delivery is carried out under the guidance of a competent professional. Follow the child's immunization schedule properly. Maintain good ear hygiene by keeping the ears clean, free from dust, water, wax etc. Do not clean or scratch the ears with pointed objects like matchsticks, hairpins, pencils etc. It can harm the ear canal or burst the eardrum. A slap or hit to the ear should be avoided since it may result in an irreversible hearing issue. Keep a watch on young children playing with tiny objects like beads, seeds etc. They risk damaging the ear canal or rupturing the eardrum if they insert them in the ear. Never put the oil or any fluid in the ear because doing so can cause discomfort, swelling, and discharge. Always keep the ears dry.

Do not swim in dirty water. Infected ears can result from contaminated water entering them. While swimming always plug the ears with cotton, especially while diving. This prevents the water from directly entering into ear and rupturing the eardrum. Do not have the ears cleaned by roadside quacks. They use unclean instruments, which may cause infection. The eardrum too may get damaged. Clean the ears with cotton buds regularly or get them cleaned by a doctor. Avoid using unwashed pillow covers, towels, etc., used by a person with ear discharge. This may cause infection in our ear too. While feeding a baby keeps its head rose otherwise milk may enter into the ear cavity. It can cause pain with swelling and ear discharge. Avoid exposure to loud sounds. Never take medication without consulting a doctor first. In noisy environments, wear ear protection while working. Many of the causes of hearing loss are uncontrollable in many cases. However, being aware of these indicators enables us to recognize people who are "at danger."

MENTAL RETARDATION

Mental retardation is a condition of arrested or incomplete development of mind of a person which is specially characterized by sub-normality of intelligence (PwD Act, 1992). Mentally retarded person is one who deviated from normal health status either physically, mentally or socially and requires special care, treatment and education. The person who have difficulties in speaking and learning is known as mentally retarded.

CLASSIFICATION OF MENTALLY RETARDED PERSON

1. Physically challenged Person - It includes orthopedically handicapped, sensory handicapped, neurologically handicapped and handicapped due to systemic diseases. For e.g. Blind, Deaf, Dumb and Crippled child. The term "Orthopedically" handicapped refers to someone who has a physical flaw or deformity that interferes with their ability to move their bones, muscles, and joints normally. Although sensory impairments can affect any of the five senses, for educational purposes, they typically refer to

impairments of the hearing, vision, or both. Access to visual and aural information is impacted by sensory impairments. Numerous illnesses fall under the category of neurological disability, including epilepsy, learning difficulties, neuromuscular problems, autism, brain tumours, and cerebral palsy.

2. Mentally challenged person- It includes impairment in an individual's ability to function cognitively, emotionally or physically due to the presence of a psychiatric condition. This illness makes it difficult for someone to carry out a task or participate in activities without help. For instance, it involves cerebral palsy and mental retardation.

3. Socially challenged person- It includes whose opportunity for a healthy personality development and full unfolding of potentialities are hampered certain elements in his social environment such as broken family, parental inadequacy, loss of parents, poverty, lack of educational opportunities, environmental deprivation and emotional disturbances as lack of tender loving care.

CAUSES OF MENTAL RETARDATION

Mental retardation can be caused due to severe malnutrition or other dietary issues, lead or mercury poisoning, childhood sicknesses, trauma before or during birth, genetic abnormalities and brain injury.

PHYSICAL ENVIRONMENT FOR MENTALLY RETARDED PERSON

The physical environment should be evaluated on the basis of the degree to which it achieves the goal of maximizing the resident's human qualities. All sheltered living arrangements for retarded children or adults who live apart from their family are considered residential services. "Institutional services" is sometimes used to refer to a specific type of living arrangement in which the residents are served on a twenty-four-hour-a-day basis. The Principle of Normalization is now widely recognized and accepted as an important approach to residential services for the mentally retarded person. The Principle of Normalization suggests a "home-like" environment whenever possible, including cottages or "small houses", home-like furnishings, easy access to the out-of-doors, opportunity for privacy and personal property, and maximum freedom for each resident. Some buildings may need to be specialized with regard to safety and manageability, including grade access, broad doors, ramps, round edges, soft floors and walls, security, glass, mechanic ventilation, special lavatories, and sound-reduction.

CARE OF THE MENTALLY RETARDED PERSON

By the prevention and early detection of mental handicaps. Regular evaluation of the limitations and accomplishments of mentally impaired people. Advice, support and practical measures for families. Provision for education, training, occupation or work appropriate for each handicapped person. Housing and social support provided to enable self-care. Medical, nursing, psychiatric and psychological services for those who require them as outpatients, day patients or inpatients. By behavior management, environmental

supervision. Monitoring child's development needs and problems. Programs that maximize speech, language, cognitive, psychomotor, social, self-care, and occupational skills.

PREVENTION

Primary prevention- In this the prevention at pre conception period can be done by genetic counselling, immunization for maternal rubella and family planning. During gestation the prenatal and analysis of fetus for possible genetic disorders can be done. At the time of delivery, by consulting with expert doctor and staff, apgar scoring and close monitoring. In childhood stage prevention can be done by taking proper nutrition and avoidance of hazards.

Secondary prevention – It can be done by the early detection and treatment.

Tertiary prevention - In this the prevention can be done by rehabilitation.

TREATMENT

Medications are mainly helpful for people who are more seriously affected by mental illness. Different medications are used to treat various forms of mental disease.

Antidepressant medications- These type of medications are now also used in combination with psychological therapies to treat phobias, panic disorder, obsessive compulsive disorder and eating disorders.

Mood stabilizing medications- These are helpful for people who have bipolar disorder. These medications can help to reduce the recurrence of major depression.

Antipsychotic medications- These are used to treat psychotic illnesses. Although some adverse effects of newer antipsychotic drugs are possible, they tend to be less common than those of earlier antipsychotics, such as muscle stiffness and weakness.

CONCLUSION

Care must be taken to ensure their comfort, safety, and physical environment in order to make the home accessible to those with disabilities. Special people's lives are made easier by new innovations, and they develop a great deal of faith in them. It is the responsibility of able individuals like us to provide the greatest possible care for them, with independence being the most important factor. An accessible home promotes maximum independence for owners or members of the family who are disabled while also providing the greatest possible mobility and comfort for other members of the family and guests. There are several house features available today that can give disabled people movement, comfort, and safety. These also help in increasing the efficiency of the person for doing their work. Interiors of homes, as well as public places with regular senior citizen visitors, such as banks, supermarkets, malls, and government buildings, should be made to be more pleasant and easy, not just with ramps and safety bars, but also with better signs, more engaging,

and soothing materials and colors. There is requirement of more steps to be taken by government as well as by society for special persons.

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