Sensory Disorder and Intervention Strategies

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ABSTRACT

The term hearing impairment is often used generically to describe a wide range of hearing losses, including deafness and hard of hearing. Hearing impairment is defined by IDEA as impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance. A healthy deaf child can run, jump, play ball, and take part in all physical education programmes which his peers do. He can and should, follow a regular school curriculum. In other words, he should be integrated into the regular classroom. In the primary school, it is a wise method for a counselor who has training or experience in communicating with a deaf pupil, to do this with paper and pencil. Writing will reduce any guesswork and anxiety for the deaf pupil. Parents need to consider every part of their deaf or hard of hearing child's school day - even times spent on the bus and ensure that there is effective communication access available to him or her. Students with disabilities been provided with technologies and devices that could be helpful to them in ways such as students who are visually impaired or blind can benefit from the use of smart scanners and readers also its easy and cheap to improve the learning environment for students who are visually impaired or blind when they record all lessons. This way students can listen to the instructions or lesson multiple times in order to make sure they completely understand what is expected.

KEYWORDS: Deafness, Intervention strategies, Interpreter, Deaf-blindness.

Introduction

The most common prenatal/pregnancy-related cause of deafness is consequence of prematurity. According to the American Academy of Family Physicians, about 5% of children born before 32 weeks (8 months of pregnancy) have hearing loss by the time they are five years old. Cytomegalovirus, another pregnancy-related cause, found to be responsible for 1.8% of the pregnancy-related cases nationally. Pregnancy complications such as prenatal infection, Rh factor, and lack of oxygen, according to the American Speech-Language-Hearing Association, are the next most cited specific pregnancy-related cause of deafness. A pregnancy complication is anything that can harm the baby, mother, or both of them, and it can be mild or serious (MOE, 2009).

According to Mont (2007), children learn about their environment as they move through it—about people and objects, sizes, shapes, and distances. For typically developing children, the senses of sight and hearing provide the greatest motivation for exploration. These children will use their vision and hearing to gather information about their surroundings while growing in understanding of their own bodies and their own capabilities of movement. The sight of toys or people and the sounds of voices or objects encourage them to move and discover. As they do so, they gather, recognize, and interpret an amazing array of sensory information.

Conceptual Review

Deafness

Deafness is defined as a hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification. Thus, deafness may be viewed as a condition that prevents an individual from receiving sound in all or most of its forms. In contrast, a child with a hearing loss can generally respond to auditory stimuli, including speech. Its characteristics include: Difficulty following verbal directions and difficulty with oral expression.

Identifying Children with Deafness

Hearing loss is diagnosed when hearing testing finds that a person is unable to hear 25 decibels in at least one ear. Testing for poor hearing is recommended for all newborns *(Lasak, Allen, McVay, Lewis, 2014).* Hearing loss can be categorized as mild (25 to 40 dB), moderate (41 to 55 dB), moderately-severe (56 to 70 dB), severe (71 to 90 dB), or profound (greater than 90 dB) (Deafness and hearing loss, 2015). There are three main types of hearing loss: conductive hearing loss, sensor neural hearing loss, and mixed hearing loss (Shearer, Hildebrand, Smith, 2014). A child who has difficulty in understanding verbal instructions and who struggles with reading and spelling, could have an auditory processing disorder.

Auditory Processing Disorder (APD) is a hearing disorder in which the ears process sound normally but the brain cannot always understand or 'hear'. Children with APD may exhibit signs of hearing loss, especially when there are competing sounds at even moderate levels, yet they pass standard hearing tests conducted in quiet.

According to Moodley (2002), for every hearing impaired child, the following questions should be considered before integration into a regular classroom:

1. When integrated, will the pupil continue to receive the special services necessary for him to benefit from the regular classroom?
2. Is the receiving teacher informed regarding the problems of the hearing impaired pupil? And is he/she prepared to help pupil learn to the best of his ability i.e. in accordance with his handicap?
3. Are the parents in agreement with the placement in a regular classroom? Is the child comfortable in the regular classroom?
4. Will the regular class pupils give the hearing-impaired child the consideration they expect to give and get from each other?
5. Is the regular class small enough so that the teacher can devote sometime to the hearing-impaired pupil with his special needs?
6. Is the lighting in the classroom bright enough to read lips, if this is necessary?

7. Is the child seated in the room to his best advantage?
8. Do sound films, shown in the classroom, have subtle effects on the child's hearing?
9. Are fires exits and alarm systems set up to alert the deaf child?

When these questions are adequately answered, the hearing impaired pupil should progress in school at a rate consistent with his potential. However, the degree of hearing loss alone is insufficient to determine a child's educational programming. A planning team must determine how he functions personally, socially, and academically; and how he responds to speech, speech signs, and other environmental sounds, both with and without a hearing aid. Variables affecting his learning are motivation, his parents' interest, community acceptance, the child's intelligence and the severity of the hearing loss. A child with severe hearing impairment who is unable to progress in regular classroom should be considered for a self-contained classroom or special school. However, as soon as the pupil shows that he can benefit from regular school placement, he should be returned there.

Causes of Hearing Loss:

Hearing loss is a common birth defect, affecting about 1 to 3 out of every 1,000 babies. A number of factors can lead to hearing loss which includes:

Otosclerosis: This is a middle ear disease. It makes it harder for the tiny bones in the middle ear to move. It causes a conductive hearing loss. This condition is often treated with surgery.

Ménière's disease: This is an inner ear problem. The cause of Ménière's disease is not known. It usually starts in people between 30 and 50 years old. A person with this disease will often have sensor neural hearing loss. Dizziness and ringing in the ear are common. Sensitivity to loud sounds may also happen. The hearing loss comes and goes, but over time some loss becomes permanent.

Autoimmune inner ear disease: An autoimmune disorder is one where your body attacks itself. This type of hearing loss happens fast. You should see a doctor as soon as possible if you suddenly lose your hearing. Medical treatment can help keep hearing loss to a minimum.

Ototoxic medications: There are some medicines that can cause hearing loss. You should talk with your doctor about the medicines you take. Some medicines that may impact hearing include the following:

- Aminoglycoside antibiotics, such as streptomycin, neomycin, or kanamycin
- Large amounts of aspirin
- Loop diuretics, like lasix or ethacrynic acid
- Some chemotherapy drugs

Very loud noise: Loud noise can cause permanent hearing loss. Noise-induced hearing loss is painless and usually happens over time. Hearing an extremely loud sound, like an explosion, can cause a sudden hearing loss.

Acoustic neuroma: This is an example of a tumor that causes hearing loss. It can also cause ringing in your ear and feeling like your ears are full. You need medical treatment for an acoustic neuroma.

Physical head injury: A traumatic brain injury (TBI), hole in the eardrum, and damage to the middle ear can cause hearing loss.

Presbycusis: This is a sensorineural hearing loss that happens as you get older. Speech may start to sound muffled or unclear. You may have to ask people to repeat themselves or turn the TV louder to hear it.

Pregnancy-Related factors:

- Prematurity

Why does prematurity put babies at increased risk for hearing loss? A premature baby's auditory system is not yet mature when the baby is born before seven months of gestation. In addition, a premature baby's ears are vulnerable to damage. CMV is very similar to rubella in how it can affect a fetus. Like rubella, it is a dangerous virus that can result in a baby being born with a progressive hearing loss, mental retardation, blindness, or cerebral palsy. Information on CMV is available from the National Congenital CMV Registry.

Post-Natal: Otitis Media:

Ear infections associated with otitis media are frustrating for both parents and doctors, who must decide whether or not to prescribe antibiotics. An occasional bout of otitis media may cause temporary hearing loss due to the fluid build-up in the middle ear, but repeated bouts of otitis media can cause permanent hearing loss.

Post-Natal: Meningitis

Meningitis is said to be one of the common post-natal causes of deafness. The antibiotics needed to treat bacterial meningitis can cause hearing loss, but this risk can be reduced with the use of steroids.

Intervention Strategies

Lip reading is only a partial help, as the average deaf listener perceives only 30% - 40% of spoken language by looking at the lips of the teacher or speaker (Green, 1979).

The hearing-impaired pupil should be given information about the disability. This is often over-looked; yet the informed person is the best spokes-man for himself and the community.

There is now robust evidence for the effectiveness of a number of interventions including but not limited to:

- Educational programme for all hearing impaired children should begin as soon as possible, preferably in infancy.
- There should be ample information for the child, family and teachers so they understand the problem and learn some simple techniques to reduce the effects.
- Hearing training therapy should be given to the impaired to improve listening skills.
- Fitting of a personal “FM” listening device (specialised for APD), particularly for classroom use, to transmit the voice of the teacher clearly, so that distance and background noise are no longer a problem.
- There should be a Language therapy to improve understanding.

Other strategies are:

1. Using an Interpreter

Communication at school is either direct (one to one) or interpreted (relayed by the interpreter between two or more parties), or a combination of both. While some students who are deaf or hard of hearing can communicate directly with their peers and instructors, many others require a qualified interpreter who's proficient in their mode of communication to convey all that's going on in the classroom. Even students with hearing loss who have strong auditory skills may be missing a lot of information when new concepts and language are introduced, when group discussions become faster-paced, or when they are positioned some distance from the speaker, like during a school play or assembly. Interpreters can be a conduit for information flow for any or all classes, school-sponsored sports, and/or extra-curricular activities (Wilkins, 1969).

While educational interpreters may not be the answer in every situation, they can be an integral mechanism for communication access. In this role, their function is complex and varied, based on the unique needs of the student. The use of an educational interpreter has advantages and disadvantages.

Advantages

Interpreters can make inclusion into the mainstream educational setting possible for many students who are deaf or hard of hearing. They can translate instructions into the mode of communication used by the student, enabling him/her to access the general curriculum taught to typical hearing peers in a regular classroom. Choosing interpreter access means that a student who is deaf or hard of hearing may be able to attend his/her neighborhood school with local playmates and siblings rather than having to attend a school for the deaf or another deaf education programme (Wilkins, 1969).

As determined by the IEP team, interpreters can take on additional responsibilities for the student who is deaf or hard of hearing. They can facilitate social interactions with hearing kids. They can pre-teach and re-teach vocabulary; check for comprehension; and remediate speech, language, and general instruction in a tutorial role. An interpreter's consistent presence in the classroom can provide a necessary perspective in IEP team discussions of the student's functionality and unique needs.

Possible benefits of using sign language for your little ones include:

- earlier ability to understand spoken words, especially from ages 1 to 2
- earlier use of spoken language skills, especially from 1 to 2 years old
- earlier use of sentence structure in spoken language
- decrease in crying and whining in infants
- better bonding between parent and child
- potential IQ increase

About half of hearing loss globally is preventable through public health measures. Such practices include immunization, proper care around pregnancy, avoiding loud noise, and avoiding certain medications. The World Health Organization recommends that young people limit the use of personal audio players to an hour a day in an effort to limit exposure to noise (WHO, 2015). Early identification and support are particularly important in children. For many hearing aids, sign language, cochlear implants and subtitles are useful. Lip reading is another useful skill some develop. Access to hearing aids, however, is limited in many areas of the world (deafness and hearing loss, 2015).

Deaf-Blindness

Deaf-blindness is a low incidence disability and within this very small group of children there is great variability. Many children who are deaf-blind have some usable vision and/or hearing. The majority of children who are deaf-blind also have additional physical, medical and/or cognitive problems. Children are considered to be deaf-blind when the combination of their hearing and vision loss causes such severe communication and other developmental and educational needs that they require significant and unique adaptations in their educational programmes.

Characteristics:

Including but not limited to disability in the following areas:

- Communication skills
- motor skills
- mobility skills

Causes:

- Largely biological (either before conception or during gestation)
- Brain Dysgenesis (abnormal brain development)
- Brain damage
- Childhood illness

Deaf-blindness can be classified into:

1. Congenital deaf-blindness – c*aused by* - Rubella

In the past, the leading cause of congenital deaf-blindness was rubella, a highly infectious viral illness (also known as German measles).

If a pregnant woman gets rubella, it can cause serious damage to her unborn baby, particularly to their eyes, ears and heart. However, because of the success of rubella vaccine and the MMR (mumps, measles and rubella) vaccine, the number of babies affected by rubella has fallen dramatically.

- *Premature Birth*

Problems associated with premature birth are a common cause of deaf-blindness. As smoking and excessive alcohol consumption are major risk factors for premature birth, you should avoid both, particularly if you are pregnant.

- *Genetic Conditions*

Some rare genetic conditions can also cause deaf-blindness, either at birth or in the early years of childhood. One such condition is known as CHARGE syndrome which is very rare, affecting about 1 in every 10,000 births. CHARGE syndrome causes a pattern of related birth defects that affect the eyes, heart, nose, genitals and ears, as well as restricting a child's growth.

2. Acquired deaf-blindness – caused by- Usher syndrome

The most common condition that causes acquired deaf-blindness is a genetic condition known as Usher syndrome, which affects around 1 in every 25,000 people. Children with Usher syndrome are born deaf and then develop a condition known as retinitis pigmentosa as they become older. Retinitis pigmentosa causes the retina - the part of the eye that responds to light - to slowly deteriorate. Eventually, the retina loses the ability to transmit information to the brain and blindness can occur.

Other causes

Acquired deaf-blindness can often occur as a result of two unrelated conditions that cause loss of vision and loss of hearing, or it can occur as a result of ageing.

For example, as one gets older, his/her vision can get worse as a result of deteriorating cells at the centre of the retina. This is known as age-related macular degeneration. A similar process can also happen with hearing, as the cells within the inner ear that help transmit information to brain become damaged or deteriorate.

Intervention Strategies

• Orientation and Mobility (O&M) instruction

Orientation and Mobility instruction provides students who are deaf-blind with a set of foundational skills to use residual visual, auditory and other sensory information to understand his or her environment. For the child who is deaf-blind, movement is an opportunity to gather sensory information, to communicate, and to make choices. O&M instruction provides opportunities and skills that can broaden the student's awareness of the environment, resulting in increased motivation, independence and safety.

• Cognitive Psychological Evaluation

Cognitive Psychological Evaluation is the process of gathering information to help us understand who a person is—important information for determining that person's educational goals. An evaluation should seek to identify strengths as well as needs. It can document the progress a person has made, and it can suggest interventions that may support further growth. For young people who are deaf-blind, meaningful psychological evaluations are critical. They can help determine what instructional goals are most appropriate and what educational services and resources will help the person achieve those goals. In addition, these assessments must carefully consider how vision and hearing losses affect a student's learning style, social behaviors, and communication skills.

Evaluation of students who are deaf- blind is a challenge to all concerned. From the psychologist's point of view, there are few professional standards to go by. Most psychological tests are inappropriate because they have been developed for students with

normal vision and hearing. Often, communication barriers exist and the psychologist cannot reliably determine the student's cognitive, social, and functional capabilities. From the student's point of view, the evaluation process can be frustrating if the tasks are not meaningful and if the materials cannot be easily perceived. For the educator and parents, test scores, such as age levels or IQs, can mask a person's true skills and competencies. Assessment reports may not provide an accurate profile of a student, and may not provide information that will be helpful. Therefore, family members, professionals, educators and the students must be able to clarify the evaluation process and the active roles that may be taken by everyone.

Learning Styles:

• Bodily- Kinesthetic

People with bodily kinesthetic learning styles learn best when they are permitted to use their tactile senses and fine and gross motor movement as part of the learning process. They often prefer direct involvement with the material they are learning rather than worksheets or reading from a book. Bodily kinesthetic learning style students understand and remember material longer when they use it in an active way. It can be effective (The National Special Needs Education Policy framework, 2009).

As a teacher, the main priority is ensuring that all students have an equal opportunity to access learning materials and succeed in every course. To teach visually impaired or blind students, a teacher should modify his/her teaching strategy, allow for the use of visual aids and assistive technology, and create a safe learning environment.

Explain any visuals: It is important to clearly explain all visual materials when teaching a visually impaired or blind student. For example, if a picture is shown to illustrate a point, the image should be described. One could say something like "I have put a picture of Queen Elizabeth on the board to illustrate the way she was depicted. She is wearing a large gown with a lot of detailed embroidery. This demonstrates her wealth and power." The habit of dictating what is written on the chalkboard or whiteboard should be employed. That way, students who are unable to see the board can still follow along with the material and take notes.

Always give oral instructions: Students should not be provided a handout that contains assignment instructions because visually impaired or blind students in the class may have difficulty seeing the words and learning what is expected. Instead, oral instructions for every assignment and activity should be given.

Ask students to clap to ask a question: Many classrooms rely on visual cues in order to ask questions or get the teacher's attention. It is very traditional for students to raise their hand if they want to speak during a lesson. Visually impaired or blind students may not notice when their peers raise their hands. Hence, visual cues should be replaced with audio cues. For example, one could have students clap twice if they want to ask a question.

Provide tactile learning experiences: When you are teaching a class with visually impaired or blind students, you should try and incorporate tactile learning experiences whenever possible. For example, instead of talking about rocks and showing images of different types of rocks, you should actually have physical rocks available in the classroom for the students to touch and handle. This can also be done with different foods, shells, properties of matter, etc. This will allow your students to explore and learn without relying solely on sight.

Address all students by name: Students who are visually impaired or blind may not always know who is talking. As a result you should always address students by their name when you call on them to answer or ask questions. This way the student who is visually impaired can learn to identify their peers based on the sound of their voice.

Give visually impaired or blind students additional time to complete work: In some instances visually impaired or blind students may need extra time to complete their assignments and tests. This is typically because reading braille or using some form of technological aide can take additional time. Although you want to give an appropriate amount of time for visually impaired or blind students to complete their work, you do not want them use their vision as an excuse to hand in work late. Set deadlines and make sure they stick to them.

Treat all of your students equally: Even though you will need to make certain modifications to your teaching style and classroom structure in order to accommodate students with visual impairments, you should still hold these students to the same standard as the rest of their peers. For example, all classroom rules and behavioural expectations should apply to all of the students in the class. Avoid giving special treatment to visually impaired students.

Consider the curriculum: When you are teaching visually impaired or blind students, you may need to modify the curriculum and the way you teach the curriculum in order to meet the students needs. For example, when teaching art, you will want to rely more on tactile experiences. Try sculpting and working with clay, instead of drawing or colouring.

Using Aids and Assistive Technology (UNICEF, 2007)

1. Record lessons. Students can record lessons using smartphone apps that can be easily downloaded for free. For better sound quality the school could invest in a microphone and recorder that could then upload the audio file to the student's personal computer.

2. Provide braille textbooks and handouts. When discovered that there is a visually impaired or blind student in the class, textbooks in braille should be ordered for all classess. You can also have all of your course materials and handouts transferred into braille by using braille translation software. This software can be purchased online and its quite affordable. This process can take quite some time, so be sure to plan well in advance.

3. Allow the use of smart scanners and readers. These technological devices will easily convert documents such as books and handouts into speech. This way students who cannot see the material presented on a written document can still access the information. The machine will actually read aloud the materials. You can also download a reader application such as the KNFB Reader which will convert printed text into speech.

4. Encourage the use of page magnifiers. Page magnifiers can be used by students with visual impairments, to help enlarge images and text presented in any book or handout. This will assist students with visual impairments in reading all course materials. These devices are relatively easy to use and range in cost and effectiveness. Handheld magnifying glasses enlarge the image approximately 2.5 times. Electronic page magnifiers can enlarge an image 10-15 times the regular size.

5. Write with dark colours on the whiteboard. Many students who are visually impaired will need written material to be presented in high contrast in order for them to read. It is best to write using a dark black marker on a whiteboard. Always write using large

images and letters to help assist with reading. If your classroom has a blackboard, you should always use white chalk. Avoid using colours. Colour should only be used sparingly for large images, such as titles.

Providing an Appropriate Learning Environment (UNESCO, 2009)

1. Seat visually impaired students close to the front. In order to give visually impaired or blind students an equal opportunity to succeed in the classroom, seat them near the front of the room close to the board. While teaching, you should stand near the visually impaired child. This will allow them to hear you better.

2. Consider lighting and glare. Visually impaired students often experience light sensitivity issues, so seating them away from the window and other glaring light is beneficial. Try and control the glare in the classroom by using blinds and curtains. Light should be distributed evenly throughout the room for optimal visual effect.

3. Ensure there are large walkways between furniture. You should also leave ample space between desks, chairs, cabinets, and shelves. This will make it easier for visually impaired and blind students to navigate through the classroom without bumping into objects. Make sure the cupboard doors and drawers are always closed and that chairs are neatly tucked under desks. If things are left slightly askew, this can cause problems for visually impaired and blind students.

4. Maintain a consistent classroom arrangement. Once you have created the classroom layout at the beginning of the school year, leave the furniture in the same place. Visually impaired and blind students will learn the layout and be able to navigate their way around the classroom without bumping into any objects. If you rearrange the furniture and seating assignments this can cause confusion for these students and will add unnecessary stress to their learning environment.

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5. Clearly explain where classroom supplies are located. You will also need to give added directional instructions when explaining where classroom supplies are located. For example, if the pencil sharpener is located next to the whiteboard at the front of the classroom, you should provide visually impaired students with clear directions from their seat.

You could say "the pencil sharpener is straight in front of your desk and then two steps left of the whiteboard." These added instructions will help a visually impaired or blind student navigate the classroom.

Conclusion

From the study above, the following conclusions have been drawn:

The hearing-impaired pupils need to be given information about the disability. All the students including the impaired ones have the right to be treated equally. Technologies and devices are available to help impaired students and pupils cope up with their normal activities and educational progress. Students with visual disability and deafness are allowed to record to lectures for better sound quality. Educational software are made available online to help disabled students cope academically.

Recommendations

1. Classrooms should maintain a regular arrangement keeping disabled pupils and students in front for proper viewing and concentration.
2. Technological devices to help improve the performances of the impaired students should be made known to them and also given to them for use.
3. For better sound quality the school could invest in a microphone and recorder that could then upload the audio file to the student's personal computer.
4. Educational software should be downloaded and installed into the students personal systems or electronic devices to help the students and pupils improve academically.

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