



Characteristics and Interventions To Improve Skills of Children With Hearing Impairment

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Abstract

This study aims to explain the characteristics, etiology, identifications, impacts, interventions, and some factors that contribute to individuals and students with hearing impairment. By using qualitative approach from data obtained from books and journal articles, it is found that there are four characteristics of individuals with hearing impairment. Hearing impairment often occurs due to genetic and non-genetic factors, and appears when the babies are in the period of language development (prelingual deafness). For facilitating individuals with hearing impairment, there are two methods; they are methods of communication and education. Three studies were found to be associated with hearing impairment. This is a basic step of literature review that relates to hearing impairment, further studies can focus on the factors contributing to hearing impairment based on educational or social context.

Keywords: children with hearing impairment, characteristics, etiology, impacts, interventions

Introduction

Yusuf (2018) has suffered a hearing impairment since he was 11 years old. The hearing impairment that happened to him occurred after he played in the river. He felt that some water from the river entered his ears. Firstly, he had a fairly high fever. After his body temperature dropped, he felt that the water in his ears had come out. Another condition occurred, he felt that his ears could not hear the information that entered through the ears.

He noticed that both of his ears had hearing impairment. For two years, he did not leave the house, due to bullying came from his playmates and some negative comments from people around him.

At the time, Yusuf (2018) was not able to accept his condition. However, his parents were able to grow Yusuf's confidence. His parents' support had grown Yusuf's self-concept.

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His parents gave him motivation to have a good achievement and to dedicate his life to family, especially his younger siblings who were still in college.

Because of his good relationship with his parents, there was no socio-emotional disorder in Yusuf. He was even active in several organizations. Besides being active in organizations, he was an outstanding student at Gajah Mada University. He actually had difficulties in learning process. These difficulties could be overcome by the support of his classmates, and an internal desire to deepen class discussions.

Heward, Morgan, and Konrad (2017) provide a definition of individuals with disabilities of education due to deafness and hearing impairment, deafness is a hearing loss that affects the process of language information when listening by using hearing aids or not, and academic performance. Meanwhile, hearing impairment is a disturbance in hearing, either permanent or fluctuating, which affects academic performance. There is a difference between individuals with deafness and hearing impairment (Heward, Morgan, & Konrad, 2017). Deaf individuals are those whose level of hearing disability affects the process of language information in hearing, by using hearing aids or not (Mangunsong, 2009). Meanwhile, individuals with hearing impairment are still able to hear with hearing aids (Mangunsong, 2009).

Andrews, Shaw, and Lomas (2011) state that the educational terminology of deaf individuals is distinguished in two paradigms, they are socio-cultural-language and perspective of medical audiology. The identity of deaf individuals is influenced by socio-cultural-language factors, such as: culture, ethnicity, family, educational experience, community, communication, and the use of visual technology (Andrews, Shaw, & Lomas, 2011). Each region has a unique pattern of communication. In Bali, Michi's research (2017) finds that 42 individuals with hearing and speech impairments, from 150-200 years ago, have developed their own sign language named Kolok language. In fact, a dictionary of Kolok language has been developed into an android-based application (Aryantika, Darmawiguna, & Putrama, 2015). The factors of medical audiological perspective such as gender, disability, age of onset, level of hearing impairment, use of auditory technology, and genetic background affect deafness of individuals (Andrews, Shaw, & Lomas, 2011). Hearing impairment in terms of medical audiology is a hearing impairment involving a medical diagnosis by a medical professional of hearing impairment (Andrews, Shaw, & Lomas, 2011). Medical diagnosis of hearing impairment on the level of hearing impairment becomes the reference of special education services for individuals with hearing impairment (Andrews, Shaw, & Lomas, 2011). Therefore, there is a relation between medical professional of hearing impairment and psychologists in providing discourse of educational interventions for individuals with hearing impairment.

Mangunsong (2009) defines deaf individuals as individuals whose hearing does not function, therefore they require education services fulfilling their needs. Deaf individuals who receive special education services are those with severe type of impairment and cannot be overcome with hearing aids (Mangunsong, 2009).

Mangunsong (2009) implies the definition of deafness based on the time of occurrence of deafness. *Prelingual deafness* is deafness that occurs before the development of speaking skills, or deafness that occurs since birth (Mangunsong, 2009). *Postlingual deafness* is deafness that occurs after the development of speaking skills (Mangunsong, 2009).

Mangunsong (2009) divides the types of hearing impairment based on damage of the hearing organ. A conductive deafness utilizes hearing aids (Mangunsong, 2009). The damage occurs due to interference with sound transmission from the auditory canal to the inner ear (Mangunsong, 2009), therefore the damage of the hearing organ is found in the outer ear canal (Mangunsong, 2009). Deafness due to perspective damage (sensorineural damage) of the auditory nerve that conveys information to the brain (inner ear problems) (Mangunsong, 2009). The perspective damage cannot be medically cured (Mangunsong, 2009). Healing of this impairment is carried out in stages by utilizing hearing aids and obtaining supported education services (Mangunsong, 2009). Deafness with conductive and perspective identification is called mixed deafness (Mangunsong, 2009). Deafness that is caused by central auditory includes neurological impairment and it is a light damage of cerebral cortex, but it is not caused by loss of the ability to hear sounds (Mangunsong, 2009). It happens because the disturbances of the cerebral cortex causing some problems in perception, organization, and understanding of sounds (Mangunsong, 2009).

This hearing impairment can be overcome by utilizing hearing aids, so they are able to establish interaction and communication as non-disabled individuals. Therefore, the definition of hearing impairment here is an individual with a hearing impairment that causes a decreasing academic performance due to impaired reception of verbal information.

Individuals with hearing impairment have obstacles in intellectual development, academic achievement, emotional and social development (Mangunsong, 2009). The interaction process requires language skills. Diction in communication is very necessary, especially in terms of assertiveness. The goal is not to offend others, so that social interactions are still well maintained.

Unfortunately, hearing impaired individuals experience difficulties in verbal communication (Mangunsong, 2009). Therefore, most of them feel lonely (Mangunsong, 2009). The Lack of verbal language understanding implies to a low sensitivity in understanding the emotional aspects of others (Mangunsong, 2009).

Most of hearing impaired individuals experience several social problems caused by their attitudes and traits that tend to be rigid, egocentric, less creative, impulsive, and less able to empathize to others (Meadow, 1975). Temper tantrums and frustration are often shown because they have difficulties in expressing it verbally (Mangunsong, 2009).

A research done by Rostami et al. (2014) finds that there are several depression symptoms of individuals with hearing impairment. Many of them experience anxiety disorder and insomnia (Rostami et al., 2014). In addition, level of depression of individuals with hearing impairment is also high.

Based on this background, this study aims to analyze the characteristics, etiology, identification, impact, intervention, and factors that affect individuals with hearing impairment. The researcher uses a qualitative approach as an alternative of research design and method of data analysis. The qualitative approach applied in this study uses literature review of several books and journal articles that relate to the discussion of this study objectives.

Result and Discussion

1. Characteristics

Three qualifications of individuals with hearing impairment (Heward, Morgan, & Konrad, 2017) :

- [1] Individuals who receive special education because of hearing impairment spreading over several varied communities (Heward, Morgan, & Konrad, 2017). The first category of hearing impairment characteristics is characteristics based on education.
- [2] Hearing difficulties affect an individual's communication and language skills, achievement, and social emotions (Heward, Morgan, & Konrad, 2017). Socio-emotional disorders are distinguished based on the type and level of hearing impairment, age of onset, family's attitudes towards students with hearing impairment, opportunity to obtain the period of language development, and presence of other disabilities (Heward, Morgan, & Konrad, 2017). The second category of hearing characteristics is based on communication and socio-emotional aspects.
- [3] Conclusions of actions and feelings of deaf students can be seen with several causes (Heward, Morgan, & Konrad, 2017). In the third category of characteristics, the characteristics of hearing impairment refer to patterns of visible behavior and actions including some problems caused by hearing impairment.
- [4] Lane (1988, in Heward, Morgan, & Konrad, 2017) states that there are similar characteristics of individuals with hearing impairment in some professional literatures attributed to African society of the colonialism era. However, these attributions do not indicate the characteristics of individuals with hearing impairment, but the paternalistic attitude of hearing experts who make those attributions (Heward, Morgan, & Konrad, 2017).

a. Literacy

Individuals with *prelingual* hearing impairment do not obtain the opportunity to develop language skills during the period of language development (Mangunsong, 2009). They will experience literacy obstacles when they are educated at school.

Heward, Morgan, and Konrad (2017) provide an example of the case of elementary school students who have problems that relate to English literacy. This is because students do not listen to 'spoken language' which supports students' 'written language' (Heward, Morgan, & Konrad, 2017). It is like '*Bobby is walked*' and '*the happy children is friending*'.

b. Speaking ability

The individual's speaking ability will experience interference due to interference while listening to sentences or words spoken from the persons whom we talk to. Heward, Morgan, and Konrad (2017) state that they omit some consonants they do not hear. Errors in speaking such as omitting the letters *s, f, th, t, ed,* and *en* at the end of words (Mangunsong, 2009).

c. Academic achievement

The deaf and hearing-impaired students experience difficulties in math and reading (Heward, Morgan, & Konrad, 2017). A study conducted by ASHA (2015c, in Heward, Morgan, and Konrad, 2017) finds that students with deafness and hearing impairment experience a slow achievement compared to non-disabled peers (Heward, Morgan, & Konrad, 2017). The achievement retardation of students with hearing impairment and deafness does not occur due to the quality of their intellectual intelligence, but because they have the same quality of intellectual intelligence (Heward, Morgan, & Konrad, 2017). The obstacles are found in understanding difficulties and communication because they do not obtain their first language well during the period of language development (Heward, Morgan, & Konrad, 2017).

d. Social Function

The deaf and hearing-impaired students often obtain bullying from their friends and social environment (Heward, Morgan, & Konrad, 2017). Therefore, they feel isolated, have no friends, do not get happiness at school and playing environments outside of school (Heward, Morgan, & Konrad, 2017). Feeling isolated is caused by the lack of friends with the same frequency (Heward, Morgan, & Konrad, 2017).

2. Etiology

The etiology of deaf and hearing-impaired individuals is genetic and non-genetic (Andrews, Shaw, & Lomas, 2011). Genetic etiology of deaf and hearing-impaired individuals is more than 50% of non-genetic etiology (Andrews, Shaw, & Lomas, 2011).

Hereditary factors dominate and cause hearing impairment, then exacerbate it in the future (Andrews, Shaw, & Lomas, 2011). Hereditary factors that contribute to hearing impairment can be a syndrome accompanied by several medical and physical disorders (Andrews, Shaw, & Lomas, 2011). The percentage of hearing impairment associated to some medical and physical disorders is about 30% of hearing impairment (Andrews, Shaw, & Lomas, 2011), but there are also those not accompanied by the medical and physical disorder syndromes (Andrews, Shaw, & Lomas, 2011). The percentage of absence of the medical and physical disorder syndromes in hearing impairment ranges around 70% (Andrews, Shaw, & Lomas, 2011).

According to Andrews, Shaw, and Lomas (2011), non-genetic disorders are *Cytomegalovirus* (CMV), *Human Immunodeficiency Virus* (HIV), Rubella, Syphilis, and *Toxoplasmosis* are infectious diseases causing sensorineural or perspective hearing impairment. According to Mangunsong (2009), the causes of sensorineural hearing impairment are meningitis, infections, drugs, ulcers, head injuries, loud noises, heredity, viral infections, systemic diseases, multiple sclerosis, measles, otosclerosis, acoustic trauma, vascular disorders, neuritis, vestibular disorders, *presbycusis*, and so on. Cartwright (1984, in Mangunsong 2009) states that sensorineural is a damage to the auditory nerve which results an impaired transfer of information to the inner ear.

3. Identification

Mangunsong (2009) states that Gesell's research has found that children at the age of 1 - 1.5 years begin to pronounce their first vocabulary. Children with hearing impairment do not show this phenomenon at these ages (Mangunsong, 2009). At the next ages, if they are not able to speak, so it indicates that the children have hearing impairment (Mangunsong, 2009). The diagnosis for the children at these ages must be careful, because children's inability to speak at these ages may also indicate that children experience a lack of environmental stimulus, emotional conflicts or autism, mental retardation, and mental disorders (Mangunsong, 2009).

Children at the age of 5 months are able to respond to the source of the sound addressed to them (Mangunsong, 2009). Their head will move to the direction of the sound (Mangunsong, 2009). This stimulus is a way to recognize the children's hearing development (Mangunsong, 2009).

Cartwright and Cartwright (1984, in Mangunsong 2009) identify children with hearing impairment in three ways, as follows:

[1] Behavioral indicators

Impaired attention, ears and head are directed to the person who is speaking, unable to follow instructions in groups, asking repeated questions, impaired speaking skills, often

not involved in a discussion process in the class, feeling isolated and isolating themselves, focusing on the faces and mouths of the people who are talking to them, and having inconsistent responses.

[2] Physical signs

There is fluid coming out from the ears, the process of respiration through the mouth, using cotton in the ear canal, showing a face with a tired expression. These are physical signs to identify children with hearing impairment.

[3] Children's complaints

Ear pain, ringing in the ear, feeling like listening to a voice from inside the head, as if there is an object in the ear, ear sores, and often getting fever and tonsillitis.

In addition, several hearing impairment identification tools have been developed, such as *The Crib-O-Gram* to measure the baby's response, *play audiometry* is to identify the children's response toward instructional stimulations to perform activities in a play environment, *tympanometry* is to measure middle ear response, *evoked-response audiometry* is to measure hearing with unconscious reactions, and *reflex audiometry* is to identify the children's reaction when they hear loud sounds with reactions such as: directing the ears and body to the source of the sound (Hallahan & Kauffman, 1994, 2006, in Mangunsong 2009). Another alternative is through the screening system in schools, both individually and in groups. (Mangunsong, 2009). The aim is to identify non-hearing-impaired and hearing-impaired students.

4. Impacts

a. Language Development Disorder

Children with *Prelingual deafness* do not obtain an opportunity to know the development of language, so the obstacles in this period will have implications for their language development. Mangunsong (2009) states that the factors causing speech disorders of hearing-impaired individuals are problems in making voice, poor voice, failure to determine tone and other problems related to language skills.

b. Academic Achievement Development Disorder

Hallahan and Kauffman (2006, in Mangunsong, 2009) state that hearing-impaired children with hearing-impaired parents have higher reading achievements. Hearing-impaired children have the same quality of intellectual intelligence as non-hearing-impaired children, but the difference lies in the quantity of concrete knowledge development (Mangunsong, 2009). There is an academic achievement index that depends on language (Mangunsong, 2009). This causes the educational achievement of hearing-impaired students becomes low and experience retardation (Mangunsong, 2009). Therefore, they are vulnerable to experience *learning disabilities* (Mangunsong, 2009).

c. Socio-Emotional Development Disorder

Patterns of social interaction are closely related to communication patterns (Mangunsong, 2009). Individuals with hearing impairment will have difficulty in these communication patterns (Mangunsong, 2009), because they will have difficulty in applying diction in a communication process, while diction affects the quality of interpersonal relationships (Mangunsong, 2009). The social environment, including hearing-impaired individuals' playmates often misunderstand them because of disturbed communication patterns. Therefore, they often feel lonely (Mangunsong, 2009).

Parental bonding, especially mother, greatly affects the emotional intelligence of children (Mangunsong, 2009). The lack of understanding that relates to communication patterns in a parent-child bond has implications for emotional problem (Mangunsong, 2009). This problem causes hearing-impaired individuals feel frustrated when they communicate with others (Mangunsong, 2009). It makes them very dependent on others (Mangunsong, 2009). In this case, parents' treatment and attitudes towards children with hearing impairment are very influential (Mangunsong, 2009). If parents accept the children's shortcomings and provide more support for them, those who have hearing impairment will have a better self-concept (Mangunsong, 2009).

5. Interventions

The difficulties often found by hearing-impaired individuals are obstacles in communication (Mangunsong, 2009). There is a debate regarding communication pattern that should be used by individuals with hearing impairment, whether by using spoken language or sign language (Mangunsong, 2009). If they use spoken language, then they are 'forced' to get used to apply oral language/speaking as their communication pattern. If the communication applies sign language, it is called manual communication pattern by using hand sign and body language (eye blinks, hand movements, and the other body parts). Apart from this debate, there is an alternative communication pattern that can be used by hearing impaired individuals, namely total language (Mangunsong, 2009). This pattern combines two characters of language, oral and manual language (Mangunsong, 2009).

Moore (2001) states that hearing impaired individuals have several methods of communication. The communication methods are manual, oral, *oral aural*, auditory, *Rochester*, and simultaneous (total communication).

The manual method is a communication method using sign language and fingerspelling (Mangunsong, 2009; Moore, 2001). Hearing impaired individuals need sign language as their means of communication. Marschack (1993, Mangunsong 2009) explains that the impact occurring if they do not use sign language is poor cognitive and social development.

According to Mangunsong (2009), the role of teachers for children with hearing impairment is to observe the cognitive development and body language of hearing impaired children, in order to be able to monitor their progress and needs. Mangunsong (2009) writes that the sign method is not in accordance with the rules of language, because most of non-hearing-impaired individuals use their *mother tongue* as the language of communication. Therefore, they have to find a solution to transfer sign language and daily language (Mangunsong, 2009).

In Indonesia, there are two characteristics of Indonesian language in the use of sign language (Mursita, 2015; Zusfindhana, 2017), namely SIBI (Sistem Isyarat Bahasa Indonesia: Indonesian Sign Language System) and BISINDO (Bahasa Isyarat Indonesia: Indonesian Sign Language). Handika et al. (2018) states that the use of SIBI is to translate spoken language into sign language accompanied by grammatical words with prefixes and suffixes (i.e., basic words, affixes, particles, etc.; Badan Pengembangan dan Pembinaan Bahasa Republik Indonesia, 2015). Meanwhile, BISINDO is the application of sign language from spoken language followed by expressions based on the context of the words expressed (Handika et al., 2018). However, according to Mursita (2015), the use of SIBI and BISINDO in Indonesia is still in debate. Furthermore, the results of Mursita's research (2015) find that the use of sign language with BISINDO is more widely applied than SIBI. In addition, research by Azmir, Purawan, and Joni (2019) explains that the use of BISINDO is found to be effective on television programs (i.e., TRANS7) in Bali Deaf Community. The same thing is also found for the hearing impaired individuals in Banda Aceh (Zuhir & Amri, 2019), it proves that the use of BISINDO sign language is able to facilitate the hearing impaired individuals to the latest information and news. BISINDO is also an effective means of communication for hearing impaired individuals in Indonesia (Yuwono et al., 2020; Fadlilah et al., 2019). For the beginning of learning and introduction to BISINDO itself, hearing impaired learners/individuals can use visual media with video including subtitle (Yuwono et al., 2020).

According to Permatasari, Degeng, and Adi's research (2019), the educations for hearing impaired students are in SLB-B, which consists of education levels TK-LB, SD-LB, SMP-LB, to SMA-LB (Mangunsong, 2014). Darma and Rusyidi (2015) state that special schools actually provide a barrier of exclusivity in education for hearing impaired students and other students with disabilities. In order to equalize education for hearing impaired students and other students with special needs, Indonesia has provided an access to education in the form of inclusive schools (Darma & Rusyidi, 2015). Equalization of education in inclusive schools is in line with the *Salamanca Statement* (Ainscow, Slee, & Best, 2019), which is written as follows:

Regular schools with [an] inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all; moreover, they provide an effective

education to the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system (UNESCO, 1994; pp. IX).

In Indonesia, inclusiveness policies are not only found at the level of kindergarten to high school education, but these policies are also found in universities (Harahap & Lelo, 2020; Juwantara, 2020; Maftuhin & Aminah, 2020). The results of Maftuhin and Aminah's research (2020) show that alumni of UIN Sunan Kalijaga (i.e., one of the inclusive universities in Indonesia) admit that they went through the lecture process with minimal obstacles and some of the alumni with special needs succeeded to finish their lectures quickly (3,5 years). Furthermore, they also state that they got jobs according to their interests and passions (Maftuhin & Aminah, 2020).

Berndsen and Luckner (2012) research the association between the *Washington State Center for Childhood Deafness and Hearing Loss (CDHL)* and *Listen and Talk* providing interventions to students with hearing impairment in eight schools. These two organizations have different philosophy of communication (Berndsen & Luckner, 2012). *Listen and Talk (LT)* focuses on the principles of auditory-verbal therapy and auditory-verbal education, while CDHL utilizes *American Sign Language (ASL)* and a bilingual educational approach in English (Berndsen & Luckner, 2012).

The aim of the program is to increase students' academic achievement, based on the communication pattern that has been chosen by the family (Berndsen & Luckner, 2012). The emphasis of LT program is a language proficiency consultation program in terms of listening and speaking (Berndsen & Luckner, 2012), while CDHL is an institution that handles hearing impaired students (Berndsen & Luckner, 2012).

The students' families, the head of ABK (Anak Berkebutuhan Khusus: The Child with Special Needs) institution, educators or therapists, and several consultant representatives of both institutions meet to discuss some things needed and the action plan during the program process (Partnership Project) (Berndsen & Luckner, 2012). Some of the Partnership Project systematics are discussions with students' families, discussions with teaching teams, observing students, presentations to the Partnership Project team, presentations to students, sharing information that relates to materials during the program, support, availability of technology that supports the program process, assessment and evaluation, development IEP, 504 development plans and practical solutions for daily practices (Berndsen & Luckner, 2012).

Partnership Project enhances students' abilities and challenges by listening and language speaking (Berndsen & Luckner, 2012). The program is not focused on making students to be ready to face challenges, but students involve themselves in a collaborative process

in order to recognize their obstacles and develop strategies to improve hearing function (Berndsen & Luckner, 2012). The purpose of inviting the students' families is to make the families understand the students' needs based on the disorders belong to them (Berndsen & Luckner, 2012). Next, the students present the acquisition of words that has been successfully heard and written (Berndsen & Luckner, 2012). The benefit of presentation activities is to increase group cohesiveness by giving appreciation to them for communicating the word acquisition and word acquisition strategies (Berndsen & Luckner, 2012). Next, the results of the Partnership Project become a material for discussion dealing with students' superiorities, challenges, strategies, and accommodations (Berndsen & Luckner, 2012).

6. Influencing Factors

a. Parenting Style of Deaf or Hard-of-Hearing Children

Research by Antonopoulou, Hadjidakou, Stampoltzis, and Nicolaou (2011) finds the contribution of maternal parenting to children with hearing loss and deafness (Antonopoulou et al., 2012). Mangunsong (2009) states that parents have a positive impact toward communication and social patterns of deaf and hearing impaired children. Parenting style of the research involves three dimensions: authoritative, authoritarian, and permissive (Raya et al., 2013).

b. Social Skill of Deaf or Hard-of-Hearing Children

Raya et al. (2013) states that parenting affects attitudes towards others and social skills. Social support affects the intellectual intelligence of individuals (Michael & Attias, 2016). It implies that parents have an important role to establish children's social skills, children's attitudes towards others.

c. Academic Achievement of Deaf or Hard-of-Hearing Children

The assessment indicators of Academic Achievement are knowledge of letters, the abilities of reading, spelling, and math calculations (Elizabeth, 2012). The results of research by Elizabeth et al. (2012) find that the participants (deaf and hearing impaired students) have abilities in academic and social environment during listening and speaking program.

Conclusion

There are four characteristics of hearing impaired individuals, those who receive special education; hearing impairment that affects an individual's communication, language, achievement, and social emotions; identified from individual's behaviors and actions; and attributions of African society of the colonialism era. There are two types of etiology; genetic and non-genetic. Meanwhile, the identification of hearing impairment is usually at the age of language development and can be identified from the behavior, physical signs, and children's

complaints. Hearing impairment has impacts on language, academic achievement, and socio-emotional development. Supportive interventions for hearing-impaired individuals are in terms of communication and education methods. Finally, there are several studies that relate to the hearing impairment, they are parenting, social skills, and academic achievement of hearing impaired students.

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