Journal of Inclusive Education
Vol. 8 Issue 1, 2024, 33-42

Effectiveness of Hearing AIDS For Vocabulary Development Among Preschool Children

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Abstract

To find out the effectiveness of hearing aids for vocabulary development among preschool children, a descriptive comparative - research study was conducted. It was hypothesized that a significant difference was observed in the achievement of vocabulary in those hearing-impaired children who used hearing aids than those who had not been intervened by hearing aids. The expressive vocabulary was measured by an indigenous dichotomous scale consisting of 95 items. The responses were scored as 1 for verbal and 0.5 were given to non-verbal and 0 for non-respondents. A pre-testing of the tool was done before the final administration of the tool. A purposive sampling technique was employed in selecting the sample. The sample was selected by an initial assessment form to select subjects for same after the administration of the tool to a sample of 30 preschool hearing- impaired children, the scores were analyzed on SPSS to find out the results. The result showed a higher level of oral expressive vocabulary among children who were the users of hearing aids as compared to those children who were not intervened by hearing aids. auditory, and speech training, and proper management and maintenance of the hearing aids had a significant role in vocabulary development among preschool children.

Keywords: *Hearing aids, vocabulary development, hearing disabled, pre-school*

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Introduction

Hearing is known to be crucial for the development of speech and language, communication, and learning. Children who have trouble hearing because of hearing loss or problems with their auditory processing continue to be a poorly under-identified and underserved group. Due to the auditory deprivation caused by their hearing loss, infants who are born deaf have limited exposure to oral language. Because of this, these kids usually have delays in their spoken language development (Yoshinga- Itano, Seday, Coulter & Mehl, 1998). The effects on a child's development are more severe the earlier in life that hearing loss occurs. On the other hand, the earlier an issue is recognized and addressed, the less severe it becomes (Woodward & Markman, 1998). At different ages, children learn to speak and understand language as well as hear. Delays in a child's ability to make sounds, learn how to make sounds, speak, and communicate can result from hearing loss. Vocabulary development is slower among hearing-impaired children. Hearing-impaired children tend to have fewer words in their vocabulary than their hearing peers (Gilbertson and Kamhi, 1995). The most rapid growth of vocabulary occurs at the developing language stage children acquire new words during the language learning stage and choose the words according to the right meaning (Wilcox & Anderson, 1998). It is generally accepted auditory acuity is a prerequisite for all linguistic development. However, it is not generally recognized except by those working in the field of communication that auditory input has a close relationship with linguistic development communication is the key to developing alignment or close relationships among family members According to recent studies, children diagnosed with hearing loss who receive services at an early age may be able to catch up with their hearing peers in terms of verbal or sign language development. Early family-centered intervention is advised if a child's hearing loss is identified to support language (speech and/or signed, depending on the family's preferences) and cognitive development (Tanaka-Matsumi & Otsui, 2004).

Many studies conducted worldwide have demonstrated that because of neuroplasticity, infants and young children who are deaf or hard of hearing today have extraordinary opportunities to develop spoken language, reading comprehension, and academic competencies at levels higher as compared to children from previous generations. (Nicholas & Geers, 2006, Yoshing-Itano, 2004).

A response to sound is elicited and measured in certain behavioral tests, from which the auditory system's function can be deduced. Behavioral observation audiometry and conditioned play audiometry are among the pediatric behavioral tests, arranged in decreasing order of task

complexity. Additional behavioral assessments include operant conditioning, tangible reinforcement, audiometry, and puppetry in windows that are not frequently utilized (Madell, 2011).

Studies on typical neonates' speech perception abilities using a non-nutritive sucking paradigm confirm that babies learn their native tongues through listening, preparing them to speak from birth (Werker, 2006). Infants prefer the speech of their mothers at birth, and they even favor songs and stories that they have heard before. The fact is that because the cochleae form and function by the 20th week of pregnancy, infants have 20 weeks of listening experience at birth. A comprehensive longitudinal study on the quantity of spoken words children hears from birth to age four was carried out by Hart and Risley. They noticed that the extra talk from talkative working-class parents and parents in professional families included more sophisticated concepts, nuanced guidance, richer vocabulary, and positive reinforcement—all of which are thought to be critical for cognitive development (Hart & Risley, 1999). There is strong evidence that teaching spoken language, reading, and cognitive skills through hearing is the most effective modality (Tallel, 2004). According to Meadow (1980), the main deprivation brought on by deafness is the loss of language rather than the loss of sound. In order for children to acquire language, they must communicate fluently with adults and have intact sensory mechanisms that allow language information to reach the brain. Numerous factors may have an impact on spoken language development in children with hearing loss, according to prospective research on the subject. These include Age at diagnosis, degree of hearing loss, parental participation, regularity of use of hearing aids, communication style, and additional disabilities. When analyzing results, it is crucial to include a large number of participants to draw valid conclusions (Blamey et al, 2001). Children with hearing loss have a lower ability to overhear because they have trouble understanding speech over long distances. As a result, technology must be used to increase a child's distance hearing as much as possible (McLeskey and Rose, 2004). Furthermore, it is imperative for early intervention specialists working with deaf infants and early childhood to prioritize communication exchanges during activities. Young deaf children start to organize their understanding of sign language when adults exchange signs in play situations like pretending to drive a car or truck and in everyday activities like getting ready for bed or going to the store to buy a toy. Language development therefore requires structured, comprehensible, and rich experiences naturally. They must keep their eyes open and take a keen interest in the deaf baby's attempts at gestural communication. Adults should remain composed in front of a baby who is playing with a toy and give the sign for the toy. Written materials can be

very helpful to parents. Furthermore, the main goals of assessing a preschooler's language are to ascertain the child's developmental traits, acknowledge the significance of the early developmental phases, and emphasize the necessity of early intervention in the event of hearing impairment for the development of language. Most of the tests measure how well an intervention works, identify reading and language impairments, and create educational interventions. Poor vocabulary is a sign of language, literacy, and cognitive difficulties, so tests tracking vocabulary development are used to evaluate preschoolers' early language skills. (Ling & Mak, 2012).

Methodology

Design of the study

The main purpose of the study was to determine the effectiveness of the hearing aid for vocabulary development among preschool children. The study was designed to determine the impact of early intervention of hearing impairment and its effect on vocabulary development. It is generally observed that delayed hearing impairment identification among preschool children hinders their ability to adapt to life in a hearing world. The rationale behind this research is that infants with hearing loss mostly go undetected until approximately 2.5 years of age. There is general agreement that the earlier hearing impairment is detected, the greater the potential of maximizing speech and language skills. The current study is descriptive/comparative.

Population

Fifty (50) diagnosed hearing-impaired children were taken as a population of the study who had not started formal schooling i.e., grade 1 on inwards. All of them are residents of Rawalpindi & Islamabad.

Sample Size & Sampling Techniques

A purposive sampling technique was used and selected through the initial assessment form. The form was developed after reviewing assessment forms used by speech and language therapists of the National Institute of Rehabilitation Medicine, Islamabad. It included factors like chronological age, age of onset, age of identification, type, degree, and nature of hearing loss, age of intervention, type of hearing aids, frequency of hearing aid use, age of exposure to vocabulary, and parental involvement in the process of language development. The assessment form was developed for the 3-7 years age group. The mean of their ages was 5 years. They were taken as the sample of the study. The sample was selected after

examining their audiological and medical reports. The parents and teachers whoever were available were interviewed to get a detailed history of the child's performance at home and in nursery class. All the information taken was noted down in the assessment form & two groups were made Group 'A' constituted the users of hearing aids and 14 in number while Group 'B' was non-user of hearing and 16 in number. They were selected from speech therapy clinics, audiological clinics, nurseries, Montessori, and through references. 18 of them were studying in nursery and Montessori classes, 5 of them were not studying due to illiterate and poor parents, 2 were with mild mental retardation, and 2 were not taking any type of speech and auditory training despite wearing hearing aids. The sample was not truly homogenous. An attempt was made to get a sample having major differences in hearing aids and all the minor differences were omitted.

Tools of Research

The main tool for the collection of data was a picture vocabulary checklist for hearing- impaired school children. It was employed to measure the expressive oral vocabulary. It was developed with the help of speech and language therapists and after a thorough review of expressive vocabulary. It was developed under the supervision of speech and language therapists and after a thorough review of the expressive vocabulary checklist made by Achenbach & Resscorla (2000), and in the light of the developmental inventory made by Dale & Fenson (1996). An expressive vocabulary checklist for normal pre-schoolers by Beitchman (1996), was also reviewed to find out the necessary skill areas which should be measured. So, the checklist of 95 items containing 20 categories was developed including body parts, animals, birds, fruits, vegetables, dresses, vehicles, foods, drinks, home appliances, utensils, natural things, colors, shapes, environmental things, toys, religious knowledge, and action words.

Validity & Reliability of the Tool

The pilot testing of the tool was carried out on six (6) hearing-impaired school preschool children 3 of whom were hearing aid users and three (3) were without hearing aids by the researcher herself, later teachers and mothers were requested to administer it again. The scores of pre-tastings were calculated to check validity with the help of formula K 20, the reliability was found to be r=0.98. Each item of the tool was calculated separately to check internal consistency and reliability. This showed that it was an indigenous, reliable, and dependable tool for measuring the expressive vocabulary of hearing-impaired preschoolers.

Administration of Tool

The sample was selected after filling out the initial assessment form, details were given in sampling techniques. This was done to collect a sample of the same characteristics except for the only difference of hearing aids. The data was collected by showing pictures of the checklist. The tool was administered in the presence of mothers, teachers, and speech therapists in one session by the researcher herself.

Data Analysis

The data collected through this procedure was organized, tabulated, and calculated.
Conclusions were drawn based on the findings of the study.

Table 1
Alpha coefficient of expressive vocabulary checklist for hearing impaired children

Steps involved	N	No of items	Alpha coefficient
Pre-testing	6	95	0.98
Main study	30	95	0.99

Effectiveness of hearing aids for vocabulary development among preschool children, table 1 indicates the reliability coefficient of the tool which includes 95 test items. It was pre-tested on 6 hearing impaired pre-schoolers three of whom were users of hearing aids. The alpha coefficient of reliability was found to be r=0.98. The alpha coefficient of the main study was r= 0.99.

Table 2
Means of the performance of two groups on all items of the checklist

	Group	N	Mean	SD	SE Mean	t test	p value
Fruits	Usersof HA	14	1.892	1.179	0.315	2.0090	0.0543
	Non user of HA	16	1.218	0.604	0.151		
Vegetables	Users of HA	14	1.392	0.741	0.378	0.6600	0.5147
	Non user of HA	16	1.125	2.259	0.185		
Animals	Users of HA	14	2.75	0.855	0.603	1.6998	0.1003
	Non user of HA	16	1.718	0.611	0.213		
Family	Users of HA	14	1.714	1.102	0.163	2.5094	0.0182
	Non user of HA	16	1.678	0.523	0.294		
Dresses	Users of HA	14	0.906	1.875	0.130	2.33	0.0157
	Non user of HA	16	2.142	0.746	0.501		
Surroundings	Users of HA	14	1.343	2.812	0.186	1.5724	0.1271
	Non user of HA	16	4.714	1.125	0.751		
Home Accessories	Users of HA	14	2.781	2.232	0.281	2.5346	0.0171
	Non user of HA	16	3.821	1.238	0.596		

Food	Users of HA	14	2.75	1.506	0.309	1.6549	0.1091
	Non user of HA	16	2.375	1.360	0.402		
Pot	Users of HA	14	2.34	1.35	0.340	0.2391	0.8128
	Non user of HA	16	1.23	1.23	0.34		

df=28

Table 2 indicates a statistically significant difference. among hearing aid (HA) users and non-hearing aid users in most of the items including fruits, family, dresses, and home accessories, hence better performance of hearing-impaired children who were with hearing aids.

Table 3

Means of Performance of two groups on all items of checklist

	Group	**N**	**Mean**	**SD**	**SE Mean**	**t test**	**P value**
Body Parts	Users of HA	14	2.785	1.179	0.315	0.5959	0.5560
	Non user of HA	16	3.062	0.997	0.169		
Colors	Users of HA	14	0.357	0.633	0.154		
	Non user of HA	16	0.625	0.619	0.214		
Religion	Users of HA	14	0.785	0.801	0.357		
	Non user of HA	16	1.468	1.431	0.201		
Vehicles	Users of HA	14	1.25	0.753	0.178		
	Non user of HA	16	1.406	0.712	0.220		
Abstract items	Users of HA	14	0.714	0.825	0.251		
	Non user of HA	16	1.031	1.007	0.132		
Actions	Users of HA	14	0.357	0.497	0.456		
	Non user of HA	16	1.5	1.825	0.245		
Tastes	Users of HA	14	0.928	0.916	0.370		
	Non user of HA	16	1.937	1.481	0.256		
Stationary	Users of HA	14	1.875	1.024	0.238		
	Non user of HA	16	1.785	0.892	0.232		

df=28

Table 3 demonstrates that a statistically significant difference was found. among users and non-users of hearing aids in items of vehicles and abstract items as $p<0.05$ while in others no significant difference was found ($p>0.05$).

Discussion

Hearing loss is an invisible acoustic filter that distorts, smears or eliminates incoming sounds especially sounds from a short distance, the consequences of which become apparent in later stages of life. Hence the current study was aimed to explore the effectiveness of the amplification for vocabulary development at the preschool stage. In this context, the 30 hearing-impaired preschoolers were selected having demographic initial characteristics. Two groups were made, 14 of them were hearing aid users and, the rest of them were hearing-impaired preschoolers without hearing aids. To test the hypothesis a checklist of expressive vocabulary was made

for hearing-impaired preschool children. These children were tested to evaluate their vocabulary skills. As the population was not only truly homogenous the standard deviation of the scores was high due to scattered dispersion around the mean. The age of intervention (amplification) has a vital role in the development of spoken vocabulary (Moeller, 2000). During the study, it was observed that children who were intervened by hearing aids at one year to one and a half years were good performers on vocabulary items at the age of five years. Although there were only three as the subjects of the sample were very less.

Some of the parents couldn't provide treatment due to financial problems although their child's hearing loss was detected earlier. Some children themselves learnt self-made signs. As most of them were highly intellectual and had better receptive language, they responded quickly as the hearing aid user group depended on auditory signals and took time to understand the message. Parents of children who do not use hearing aids may be able to identify hearing loss early in their child's life and potentially reverse its effects if they are knowledgeable about the causes and effects of hearing loss. The effects on a child's development are more severe the earlier in life that hearing loss occurs. Similarly, the impact will ultimately be less severe the earlier the issues are recognized, and intervention starts.

Problems of hearing impairment are common, but they are also among the most neglected physical impairments. It became evident during the study that untreated hearing loss led to numerous social and psychological problems, usually the children with hearing loss problems were isolated, less attentive, had reduced social contacts, lost intimacy, and their conversation was shorter and less frequent among psychological effects shame, guilt, insecurity and frustration was seen. They usually avoid meeting strangers and some of the children were found to have a high self-concept and ego-centered, as they refused to answer the researcher at any cost, but they agreed to do so with their teachers.

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Citation of the Article:
Inam., A. & Nabeel., T. (2024). Effectiveness of hearing aids for vocabulary development among preschool children. *Journal of Inclusive Education*, *8*(1), 33-42.

Received on: February 2, 2024
Revised on: December 19, 2024
Accepted on: February 6, 2025