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DEVELOPMENT OF LANGUAGE AND DAILY FUNCTIONING OF CHILDREN WITH HEARING IMPAIRMENT

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ABSTRACT

Background: Language development is a crucial aspect of child development, as it plays an essential role in communication and social relationships. Severe hearing impairment can affect speech and language development, making it challenging for children with hearing loss to acquire communication skills. Children with hearing impairment may experience delayed language development and may require additional support to achieve age-appropriate communication skills. The aim of the study is to observe how well children with hearing aids develop language and how well they perform daily activities based on the developed language.

Objective: To determine language ability and everyday functioning of children with hearing impairment.

Methodology: : An observational cross-sectional study design was used. The study was conducted in The University of Lahore and data was collected from FMH Lahore, Children's Hospital Lahore, Bases Lahore, Social Welfare Complex Township Lahore and Hamza Foundation, Johar Town Lahore. The study was conducted in 6 months (October22-March23). Children aged 2-6 years both male and female gender with severe to profound hearing loss using any type of hearing aid and taking speech therapy were included. Children with cochlear implant and co-morbid disorder were excluded. Data was collected from 161 parents of children with hearing impairment through questionnaire, which was provided to parents and teachers. After data collection, we analyzed the data through SPSS and concluded the results.

Results: It is concluded that out of 161 male (68.3%) and female (31.7%) children with hearing impairment, 142 (88.2%) children always wore hearing aids. In this research the Peach score was (48.4%) in Quiet environment and (45.3%) in Noise and the overall Peach score was (41.6%). After applying portage guide, out of 161 children (of ages 2-6 years), 4.3% children showed 0-1 years, 13.7% showed 2-3 years, 67.7% showed of 4-5 years and 14.3% children showed language age of 6-7 years.

Conclusion: The findings of the study show that children with hearing aids perform better in their daily life functioning. Children with hearing impairment using hearing aids and also taking speech therapy, develop language effectively and communicate in an efficient way thus improving their everyday functioning.

Key words: Language development, everyday functioning, hearing aid.

1. INTRODUCTION

One of the most amazing processes of human development is responsible for the development of language in infants. Language is a special and intricate skill that evolves naturally without certain try or conventional commands; it is used instinctively without mindfulness of its basic logicality; it is descriptively identical in all humans; and it is clear from more extensive capabilities to proceed facts or act logically.(Davis, Harrison, & Cowan, 2022)

Two ears engage people to give effectively. Having great dexterity between the two ears makes for more obvious shocked speech, spatial attention, ease of tuning, and better communication in speech. The frequency of sensorineural hearing impairment at world entry >40 dBHL is estimated to be 1.86 per 1,000 children in developed countries, with 30-40% being unilateral. Lack of

binaural information and decreased discernibility negatively affect the above factors as well as personal match and satisfaction.(van Wieringen, Boudewyns, Sangen, Wouters, & Desloovere, 2019)

The World Health Organization (WHO) defines hearing loss as mild (26–40 dB HL), moderate (41–60 dB HL), severe (61–80 dB HL), or profound (81 dB HL or more). ucha.1 Hearing loss is the most common cause of long-term disability. Currently, 360 million people, or 5% of the world's population, suffer from hearing loss. Hearing loss in the better ear is 35 dB HL or more in children and 40 dB HL or more in adults. However, even a mild unilateral hearing loss can cause significant difficulties for a person. Ear disorders that affect the middle ear (conductive hearing loss), the inner ear (sensory hearing loss), or both can lead to hearing loss (combined hearing loss). Depending on the cause, hearing loss can be temporary or permanent.(Graydon, Waterworth, Miller, Gunasekera, & Otology, 2019)

When a child is diagnosed with hearing loss, the primary concern is language development and areas of development such as cognition and socio-emotional development that depend on timely language acquisition. If deaf children cannot access the language spoken at home and non-deaf family members are not familiar with sign language, this concern can quickly turn into a developmental emergency. Hearing aids and cochlear implants, for example, are common medical and educational interventions that address hearing loss without incorporating spoken language instruction.(Murray, Hall, & Snoddon, 2019)

Working memory, cognitive flexibility, response inhibition, self-control, interference control, and executive function (EF) are examples of top-down cognitive skills. Longitudinal studies have shown that EFs are crucial for social, moral and communication skills, emotional regulation and academic performance.(Nicastri et al., 2021)

Deaf children generally experience interruptions in auditory input that can affect normal cognitive, psychomotor, and behavioral development and alter brain programming downstream (18-20). Hearing loss has been shown to impair children's cognitive development. Consistent with these observations, it was found that hearing-impaired children exhibited more behavioral problems and shorter attention spans than their hearing peers.(Korkmaz)

A collector obstruction is resolved by hearing bad luck. Multiple restrictions can also corrupt language signs. While hearing aids such as cochlear inserts (CI) and body-worn hearing aids (HA) are used, a conferencing incident actually distorts the speech signal, requiring faster handling. According to previous research, children with hearing loss should have a higher signal-to-noise ratio (SNR) in order to be able to perform listening tasks at the same level as children with normal hearing. The combination of source and transmit signal degradation, along with authority clipping, can provide a sufficient percentage of lateral bias to exhibit sustained distress evident in adolescents with IC/HA. Additionally, additional barriers to authority also occur between hard-of-hearing jokes with concurrent speech impairments or sensitive school language. which are judged both from the low level (perceptive) and from the critical level (phonetic) taking care of their limits. There appears to be a link between the effort of the saw and the difficulty of the task. The organic authenticity of an audit is critical when examining the effect of sign degradation on children's wisdom and understanding. To form an opinion about the results, the essay's tasks and listening conditions must be consistent meetings.(Brännström, Lyberg-Åhlander, & Sahlén, 2022)

It is possible that the main contributing factor to the academic difficulties that deaf children generally face is the lack of a solid foundation in language skills. Although the auditory information they receive from hearing aids or cochlear implants (CIs) does not guarantee access to language, many deaf children grow up in an environment of zero oral tolerance. The child who needs to be constantly and constantly exposed to a language while the brain is still flexible enough to learn it. That child may experience tongue deprivation if they don't have access to the tongue during the sensitive period. Significant language delays, cognitive deficiencies, as well as other physical and psychological issues, may result from this. This suggests that tongue access is a medical issue that needs to be addressed.(Humphries et al., 2019)

Because of its prevalence, wide diagnostic scope, and serious consequences, hearing loss in children is a challenging health problem. By resulting in delayed speech and language development, social isolation, emotional challenges, psychopathology, and subpar academic performance, it might obstruct future relationships and employment chances.(Batthyany, Schut, van der Schroeff, & Vroegop, 2023)

The rules for using language in a given situation are the pragmatic aspects of language. There are three main skills involved in this social use of language: 1) use language for different purposes

(e.g. for greeting, information or request), 2) Adapt the language to the listener or the circumstances and 3) respect the rules. Conversation (how to change, stay on topic and explain). These skills generally begin to develop in childhood and basic competence is demonstrated by the age of eight. It has been found that deaf or hard of hearing children develop pragmatic skills later or differently than other children.(Yoshinaga-Itano, Sedey, Mason, Wiggin, & Chung, 2020)

In reality, over the past 20 years, the majority of research on deaf students have revealed a general delay in a number of executive functioning skills, including verbal working memory.(Davidson et al., 2019)

Stevens and colleagues discovered that 9.8–12.2% of adults and 1.4% of children worldwide suffer hearing loss. Particularly in low- and middle-income nations, this frequency is high. It is not sufficient to evaluate a person's health state just on the basis of physical measurements. HRQoL evaluation is essential for gaining a thorough knowledge of how health issues impact people. Hearing loss may have an impact on your quality of life. Children who have trouble hearing have trouble connecting with their surroundings, which affects their psycho-intellectual and social growth. There is a dearth of studies looking at how wearing hearing aids affects a child's quality of life, particularly at school. The aim of this study was to investigate the effects of hearing aid noise on the quality of life of children with hearing loss, gender, number of siblings, mother's education, and how long children with hearing loss used hearing aids.(Ruspita, 2022)

2. MATERIAL AND METHOD

Cross-sectional observational study design was used. The study was conducted in The University of Lahore and data was collected from Hamza Foundation, Johar Town Lahore. The study was conducted in 4 months (October-February) after the approval of the synopsis. Sample size was calculated at 95% level of confidence and 5 % margin of error. The anticipated proportion of children having problem in language development with hearing impairment is 30%. Purposive Sampling Technique was used. Children aged 2-6 years with severe to profound hearing loss using any type of hearing aid were included. Both male and female gender were included**.** Children with cochlear implant and co-morbid disorder were excluded. Data was collected through standardized questionnaire PEACH and PORTAGE guide after taking inform consent and was distributed among parents of Hearing impaired children. Questionnaires were filled by parents regarding

everyday functioning. Therapist assessed the child's language ability through the standardized questionnaire. Results score were recorded. After the completion of data, frequencies of each question were calculated through statistical package for social sciences (SPSS) to evaluate final results of research.

3. RESULTS

Table no. 1:

PEACH Overall Scoring

	Frequency	Percentage%	Cumulative Percentage%
0-25%	17	10.6%	10.6%
26-50%	67	41.6%	52.2%
51-75%	41	25.5%	77.6%
76-100%	36	22.4%	100.0%
Total	161	100.0%	

Table 1: Describes the overall response of 161 children with hearing aid. It shows that 41.6% children are 26% to 50% responsive.

Portage score

	Frequency	Percentage%	Cumulative Percentage%
0-1 years	7	4.3%	4.3%
2-3 years	22	13.7%	18.0%
4-5 years	109	67.7%	85.7%
6-7 years	23	14.3%	100.0%
Total	161	100.0%	

Table no. 2:

Table 2: Describes the language age of children of 2-6 years of age with hearing aid. It shows that 67.7% children have a language age of 4-5 years.

Table no. 3:

Distribution

Chronological Age	**Language Age**			
Years	**0-1years**	**2-3years**	**4-5years**	**6-7 years**
2	4	2	0	0
3	3	4	0	0
4	0	16	5	0
5	0	0	62	0
6	0	0	42	23
Total (161)	7	22	109	23

Table 3: Shows the distribution of 161 children of 2-6 years of age according to their language age.

4. DISCUSSION

The participants in the study were hearing-impaired children and their parents. The study was conducted on a group of 161 male (68.3%) and female (31.7%) children with hearing impairment using hearing aids. Through PEACH questionnaire it was found that 88.2% of children always wore hearing aids. In this research the PEACH score was (48.4%) in Quiet environment and (45.3%) in Noise and the overall PEACH score was (41.6%). After applying PORTAGE, out of 161 children (of ages 2-6 years), 67.7% showed language age of 4-5 years.

The findings of this study are comparable to those of a study carried out at South Africa's Pediatric Public Hospital in January 2022, which revealed that daily hearing aid usage rose considerably from baseline after one month (p 0.05; 3.0 SD; range, 0.3-14.0) and at three months after adjustment by 3.4 SD; range, 1.1-16.8). In Silence, the mean PEACH score was higher than in Noise (73.4% vs. 69.6%). The majority of kids (52.2%) who received a PEACH General Index score sought an audit. Higher overall PEACH scores were connected with higher mean daily hearing aid use ($p = 0.05$). Children with neurotypical development used hearing aids substantially more often than children with additional difficulties (p 0.001). The benefits and drawbacks of

utilising hearing aids were determined through qualitative input from medical specialists.(Kuschke, Le Roux, & Swanepoel, 2022)

This study was conducted on a group of 161 male and female hearing-impaired children who wore hearing aids. The standardized questionnaire PEACH was used in the research. The results of this research show that 88.2% children always wore hearing aids and the PEACH score is higher in Quiet (48.4%) than in Noise (45.3%) and the overall PEACH score is (41.6%). In contrast to this study, C Zyl did a study in 2023 that revealed that bilateral portable hearing aids users used hearing aids for an average of 6.5 hours per day (2.0 standard deviation, SD; range, 4.1 to 10.3). The majority of teenagers (PEACH: 83.3%; TEACH: 92.3% of respondents according to survey data) wore hearing aids more often than 75% of the time. Participants performed better in places that were calm and less noisy, such as at home or school. Device stigma and compliance were obstacles.(Zyl, Roux, & Swanepoel, 2023)

5. CONCLUSION AND RECOMMENDATION

The findings of the study shows that children with hearing aids perform better in their daily life functioning. Children with hearing impairment using hearing aids and also taking speech therapy, develop language effectively and communicate in an efficient way thus improving their everyday functioning. It is recommended to use the data and results provided by this research to help meet the current and future needs of the parents having children with hearing impairment. The data provided by this research is open for the researchers who are doing research in the disciplines of Speech and Language Pathology and Audiology.

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7. SOURCE OF FUNDING

Nil

8. CONFLICT OF INTEREST

We have not conflicted of interest to disclose

9. SENT AND ETHICAL APPROVAL

As per international standard or university standard guideline Patient’s consent and ethical

approval has been collected and preserved by the authors

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