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Auditory Performance among Hearing Impaired Children Who Were Enrolled In Special School in Karachi

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I. INTRODUCTION

A child's first capacity to perceive and recognize speech is impacted by a hearing impairment. In the case of sensorineural hearing loss (SNHL), it may filter and distort sound, or it may cause variable hearing levels in the case of conductive loss (Mahshie, J.,Lee, J. & Scott, S.

M. 2006). The evolution of auditory skills, which are important for the development of receptive and expressive language abilities as well as speech intelligibility, is delayed in both disorders. These auditory skills include things like detection, discrimination, recognition, comprehension, and attentiveness. In turn, a delay in the early development of auditory skills brought on by hearing loss has a negative impact on a child's ability to learn and use an auditory-oral language system. Due to the filtering effects of hearing loss and the underdeveloped auditory abilities caused by hearing impairment, spoken language development frequently affects all domains. These areas lie under the categories of form (syntax), language norms, content (semantics), word meaning, and use (pragmatics), or the use of language in social contexts. At the newborn, toddler, and preschool ages, delays in any of these areas cause problems with comprehension, expressive communication, and learning. Children with hearing loss who attend school usually have difficulty in language-based classes, on testing, participating in class, and having verbal exchanges with peers and teachers. In general, these problems have a detrimental effect on academic performance and frequently lead to school failure, particularly in the lower grades. Up until a child learns to read for new information, the majority of learning in the classroom

happens through the auditory channel.

The purpose of the study is to gain a better understanding of how children with hearing impairment use hearing aids and other therapeutic strategies in hearing-impaired schools.

STATEMENT OF THE PROBLEM

The auditory skills being investigated in this study include sound perception/awareness, auditory feedback, sound localization, sound discrimination, and short-term auditory memory.

Objective of the study

1. To learn the language used for communication in a Karachi special school

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2. To determine the severity of the disability.
3. To identify the kinds of amplification tools utilized by young people with hearing loss.
4. To assess the regularity of a hearing aid use.
5. To learn about the child's speech treatment services.
6. To learn the therapist's therapeutic philosophies.
7. To assess the effectiveness of the kids' hearing aids.
8. To determine the child's hearing maturity.
9. To determine whether the youngster accepts hearing aids.
10. To learn about the child's assigned sitting at the school.

Hypothesis of the study

1. Due to the overuse of whole communication, children receiving speech therapy in special schools are not proficient in verbal expressive language because they are not receiving the proper communication environment.
2. Children lack the required auditory memory skills for their age.
3. The majority of kids wear electronic, programmable hearing aids.
4. The school offers programming and maintenance services for hearing aids.
5. Children who have hearing loss receive no more than two sessions every week.
6. Each child's hearing is evaluated once every six months.
7. Children with substantial hearing loss are prevalent.

Scope of study

This study will look at the auditory abilities of hearing-impaired students at special schools in Karachi, including sound perception/awareness, auditory feedback, sound localization, discrimination, and short-term auditory memory.

Definition of key terms

1. **Hearing Impaired:** An impairment in hearing is defined as "a hearing impairment, whether permanent or variable, that adversely affects a child's academic performance."
2. **Hearing aids:** A hearing aid is a piece of technology that enhances sound and is worn inor behind the ear by those who have partial hearing loss.
3. **Communication**: The act of giving, receiving, and exchanging knowledge is frequentlyreferred to as talking, writing, listening, and reading.
4. **Sensorineural Hearing Loss**: An audiological condition that leaves a person sensorineural deaf. The auditory nerve, which connects the ear to the brain, inner ear damage, or damageto the brain itself can all cause it.
5. **Conductive Hearing Loss:** When the cochlea, the hearing part of the inner ear, is unable to receive sound energy, conductive hearing loss results.
6. **Variable/Fluctuating Hearing Loss:** Hearing loss either gets better, becomes worse(fluctuating), or stays the same over time (stable).

II. Review of literature

Tye-Murray (2009) asserted that hearing-impaired people or children who have a profound type of sensorineural hearing loss had the capacity to acquire and effectively use their language, speech,and listening skills with the help of technological advancement (such as cochlear implants or digital hearing aids), neonatal hearing screening, and advanced signal processing methods of hearing/auditory. The most recent improvement in the administration of the Auditory-Verbal Therapy programme, according to Rhoades (2006), was to intervene and educate the young person who had hearing loss. This technological development was also mentioned by Ling (2002) in a study. For kids with hearing impairment in various methodologies

programmes of educational approaches, effective use of hearing technology helps them make better development in their language and speech results. Adequate usage of hearing equipment was referred to be a "shifting target" by Geers (2005). There are several educational opportunities available to parents and children who suffer hearing loss. According to Tye-Murray, parents of hearing-impaired children use the whole communication technique, auditory-oral treatment, cued speech method, bicultural/ bilingual programmes, and auditory verbal therapy in a variety of educational settings (2009). According to Easterbrooks (2002), bilingual/bicultural educational programmes (such sign language and English) place a strong emphasis on teaching two languages, with English being taught as a secondary language through the use of sign language, reading, and writing. It is very difficult to compare the facts and findings of various types of research on the outcomes for peoplewith a hearing deficit in the various educational techniques because the outcomes in the heterogeneous population are influenced by the numerous interaction variables mentioned by Eriks-Brophy (2004). Individuals with hearing loss may experience different results depending ontheir educational strategy, age at which hearing loss was discovered, audiological intervention, educational intervention, hearing devices, cognitive ability, family engagement, communication, and an etiology (Pyman, Blamey, Lacey, Clark, & Dowell, 2000).

According to Rhoades (2006) and Goldberg & Flexer, different educational approaches may haveovert and covert distinctions in technique, service development, therapeutic emphasis, strategy, principles, expectation, and assumption (1993). All educational intervention programmes are made to support young people with hearing loss in learning the language they need to communicate. However, no single programme, according to Ling (2002), is suitable for assisting hearing- impaired people in improving their receptive and expressive language abilities. Due to these advances, emphasis on the auditory verbal and auditory oral approaches has increased forsuccessful advancement in the development of spoken language and listening abilities. Now, young people who are deaf or hard of hearing can sign up for auditions (Ling, 2002). Although there is little proof of the effectiveness of any of the currently used instructional tactics (Yoshinga-Itana, 2004). This issue also affects research findings in speech, language, and audiology because neither their unique documentation nor their unbiased evaluation have ever been done.

As the child's main source of exposure to language, families are essential to language development, according to Easterbrooks and Baker (2002, pp. 26, 36). They made the argument that communication was taught and exchanged within the cultural contexts of the family and that it would not develop naturally in the absence of these social and pragmatic constraints. Gunning (2007) highlighted this point by stating that parents must actively engage in their children's life and that achieving achievements at school cannot be done alone. It is a responsibility shared by allcitizens, and most importantly, it cannot be done alone. According to reports, after implantation, auditory performance dramatically increased (O'Donoghue, 2000). On the basis of the observations that sound is an inherently sequential signal, and that auditory perception fundamentally depends on serial order, it has been suggested that early sound exposure provides crucial experiences with tracking sequential patterns in the environment, representing temporal or sequential patterns (Conway et al.,2009, p. 275).

The majority of deaf children perform worse in reading than their hearing peers, despite having intellect ratings in the normal range (e.g., Conrad, 1979; Kyle & Harris, 2010; Lederberg, Schick,& Spencer, 2013; Wauters, van Bon, & Tellings, 2006). Large-scale studies reveal that reading skills appear to develop at only a third the rate of hearing children, and deaf school leavers have reading ages that are substantially behind their chronological years (see Qi & Mitchell, 2011 for a review) (Allen, 1986; Kyle & Harris, 2010).Children who are deaf or hard of hearing are at risk for major language problems in their early years and literacy problems in their school years. Nicholas Geers and Sedey, 2003). Children with HI are considered active and capable conversational partners, provided that the conversational environment is optimal, despite the fact that their conversational methods differ from those of their peers who are normal hearing(Sandgren

et al., 2015). However, the conversational setting is rarely optimised in the classroom. In general, background noise makes communication less understandable and makes it harder for listeners to remember what was said (Rabbitt, 1990; Pichora-Fuller et al., 1995; Baldwin and Ash,2011; Hygge et al., 2015).

Initial research on the impact of unilateral cochlear implantation on vocabulary growth and auditory speech perception in prelingually deaf children was primarily concerned with these two areas. These investigations revealed considerable vocabulary gains and improved speech recognition in kids with cochlear implants (Schauwers, Gillis, Daemers, De Beukelaer, & Govaerts, 2004). Several studies also noted that an increasing proportion of kids with CI were ableto enrol in regular schools. Compared to deaf education, deaf children with CI in normal schools had better educational outcomes (De Raeve, & Lichtert, 2011; De Raeve, Vermeulen, & Snik, 2015; Geers, Brenner, & Tobey, 2011; Langereis & Vermeulen, 2015). Due to their restricted access to spoken language, there is little research on the verbal intelligence quotient (verbal IQ) of deaf children. Children who are prelingually deaf have a performance intelligence quotient (performance IQ) that is significantly greater than their verbal IQ (Geers & Sedey, 2011; Vernon, 2005). The underdeveloped auditory and linguistic systems were blamed for the discrepancy between verbal and performance intelligence. The cochlear implant played a significant part in the rehabilitation of hearing and is especially helpful for kids who have multiple disabilities because it helps them develop their auditory and speech skills, which constitute a valuable asset in the context of their other impairments.

Placement of pupils with special educational needs in regular classrooms as opposed to segregated special schools and special courses has significantly increased over the past two to three decades. Auditory difficulties in sound localization and speech understanding in noise are particularly prominent in listeners with UHL (e.g., Gatehouse & Cox 1972; Bess et al. 1986; Slattery III & Middlebrooks 1994; Ruscetta et al. 2005; Linstrom et al. 2009; Reeder et al. 2015). Even in the best listening environments, children with UHL perform worse and more inconsistently than peerswith normal hearing (NH) according to studies on speech perception (Bess, Tharpe, and Gibler 1986). Twenty children (6–16 years old) with UHL were assessed on a range of auditory activities, including word identification in quiet and in noise, sentence recognition in diffuse noise, and sound localization, in a more recent study by Reeder and colleagues (2015). Compared to age-matched, normal-hearing subjects, children with UHL performed worse and in a wider range of tasks.

III. RESEARCH METHODOLOGY

Study population:

Children with hearing impairment who attend special schools made up the study's sample. The study was carried out in Karachi. Numerous non-government schools for hearing-impaired students were chosen. The study's goal was to examine how hearing aids, a treatment strategy, areused by school-age children who have hearing loss. The auditory skills being investigated in this study include sound perception/awareness, auditory feedback, sound localization, sound discrimination, and short-term auditory memory. The study's participants are school-age youngsters with hearing impairments.

Sample of the Study:

Ten children were part of the study's sample. The majority of respondents had hearing impairments and were enrolled in the pre-primary division of students in attendance at schools.

Equipment used in the Study:

A structured questionnaire was used as the study's instrument, and the responses were watched. Every question was written with the research topic in mind. There were two principal divisions. The child's general information is gathered in Section A. Collect the child's audio information forsection B. The survey is included as an appendix. Before being finalized, the questionnaire's draught was pre-tested. The major goal of the pre-testing was to see whether the questions were appropriate and effective in eliciting enough responses, as well as to identify any issues that the interviewer or respondents may have encountered.

Sampling Technique:

The sample was drawn at random from the community of school-age children with hearing impairments.

Data gathering and analysis steps:

For the purpose of gathering data, the researcher went to various hearing-impaired schools. The questionnaire was filled out by the researcher as she observed the kids' responses. The information was tallied and coded. The frequencies and percentages were summarized in a generic tabulation.

Study limitation:

Children who attend special schools and have hearing impairments will make up the study's sample. Several non-government hearing-impaired schools have been chosen, and the study will be done in Karachi city.

Study duration:

The study will last for 6 months starting from the time the research application is approved.

INTERPRETATION OF THE RESULT

Sex of the Respondents

Table number 01 presents the sex of the respondents

Table # 01

Description	Frequency	Percentage
Male	18	60
Female	12	40
Total	**30**	**100**

The largest group of sex was Male (60%) and the other was Female (40%).

Age of the Respondents

Table number 02 presents the age of respondents observed in the study.

Table # 02

Description	Frequency	Percentage
3-4 years	9	30
5-6 years	15	50
6- above	6	20
Total	**30**	**100**

The highest number of respondents falls in the age range of 5-6 years (50%). The second highest number of respondents falls in the age range of 3-4 years (30%). The rest were of the age 6- aboveyears (20%).

Mode of communication in school

Table number 03 presents the Mode of communication in School.

Table # 03

Description	Frequency	Percentage
Sign Language	12	40
Speech reading / Lip-reading	-	-

Auditory approach	-	-
Total communication	18	60
Total		**100**

The highest number of respondents use the mode of communication in school Total communication (60%). The second highest number of respondents use a mode of communicationin school Sign Language (40%).

Class Studying

Table number 04 presents the class studying.

Table # 04

Description	**Frequency**	**Percentage**
Nursery	9	30
K.G.I	9	30
K.G.II	6	20
I	6	20
Total	**30**	**100**

The largest groups of respondents were (30%) & K.G.I (30%). The rest of the respondents were in K.G.II (20%) & I (20%).

Degree of impairment

Table number 05 presents the Degree of hearing loss.

Table # 05

Description	**Frequency**	**Percentage**
Mild	-	-
Moderate	-	-
Moderately severe	-	-
Severe	15	50
Severe to profound	3	10
Profound	12	40
Total	**30**	**100**

The largest number of respondents had a severe degree of hearing loss (50%). The second largestnumber of respondents had a profound degree of hearing loss (40%). The rest of the respondents were severe to profound degree of hearing loss (10%).

Type of amplification Device

Table number 06 presents the type of amplification Device.

Table # 06

Description	**Frequency**	**Percentage**
Digital Body worn	-	-
Analog Body worn	15	50
Digital B.T.E	-	-
Analog B.T.E	15	50
Total	**30**	**100**

The largest number of respondents had Analog Body-worn (50%) and Analog B.T.E (50%).

Usage of Hearing Aid

Table number 07 presents the consistency of the usage of hearing aid.

Table # 07

Description	Frequency	Percentage
Consistent	21	70
Inconsistent	9	30
Total	**30**	**100**

Therapy services

- **Speech Therapy Services**

Table number 08 presents the speech therapy services.

Table # 08

Description	Frequency	Percentage
Yes	30	100
No	-	-
Total		100

The total number of the population taking speech therapy services (100%).

- **Speech Therapy's place**

Table number 09 presents the speech therapy places.

Table # 10

Description	Frequency	Percentage
In School	30	100
In Hospital	-	-
In Speech Clinic	-	-
In School & In Hospital	-	-
In School & In Speech Clinic	-	-
Total	**30**	**100**

The total number of the population taking speech therapy services in school (100%).

Therapeutic Approach

Table number 11 presents the therapy approach.

Table # 11

Description	Frequency	Percentage
Group Therapy	30	100
Individual Therapy	-	-
Total	**30**	**100**

The total number of the population taking speech therapy services in the group (100%).

Auditory Information

- **Respond to loud environmental sounds quietly.**

Table number 12 presents the Child's response to loud environmental sounds inquires.

Table # 12

Description	Frequency	Percentage
No	3	10
Minimal	6	20
Moderate	15	50
Significant	6	20
Total	**30**	**100**

The largest number of respondents gave moderate responses (50%) on loud environmental soundsin quiet. The second largest number of respondents gave a minimum response (20%) on loud environmental sounds in quiet and a significant response (20%) on loud environmental sounds in quiet. The rest of the respondents gave no response (10%toon loud environmental sounds in quiet.

- **Respond to loud environmental sounds in noise**

Table number 13 presents the Child's response to loud environmental sounds in noise.

Table # 13

Description	Frequency	Percentage
No	24	80
Minimal	6	20
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave No response (80%) to loud environmental sounds in noise.The second largest number of respondents gave minimal responses (20%) to loud environmental sounds in noise.

- **Respond to loud speech sound quiet**

Table number 14 presents the Child's response to speech sounds in quiet.

Table # 14

Description	Frequency	Percentage
No	9	30
Minimal	15	50
Moderate	6	20
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave minimal responses (50%) on speech sound in quiet. The second largest number of respondents gave no response (30%) on speech sound in quiet. The restof the respondents gave moderate responses (20%) on speech sound in quiet.

- **Respond to speech sound in noise**

Table number 15 presents the Child's response to speech sounds in noise.

Table # 15

Description	Frequency	Percentage
No	30	10
Minimal	-	-
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no response (100%) on speech sound in noise.

Sound is Meaningful

- **Attend to loud environmental sounds quiet.**

Table number 16 presents the child attending to loud environmental sounds in quiet.

Table # 16

Description	Frequency	Percentage
No	12	40
Minimal	6	20
Moderate	12	40
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no attention (40%), and moderate attention to loud environmental sounds in quiet. The second largest number of respondents gave minimal Attention (20%) to loud environmental sounds in quiet.

- **Attend to loud environmental sounds in noise**

Table number 17 presents the child attending to loud environmental sounds in noise.

Table # 17

Description	Frequency	Percentage
No	27	90
Minimal	3	10
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no attention (90%), to loud environmental sounds in noise.The second largest number of respondents gave minimal Attention (10%) to loud environmental sounds in noise.

- **Attend to loud Speech sounds in quiet.**

Table number 18 presents the child attending to loud environmental sounds in quiet.

Table # 18

Description	Frequency	Percentage
No	12	40
Minimal	15	50
Moderate	3	10
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave minimal attention (90%) to speech sounds in quiet. The second largest number of respondents gave no Attention (10%) to speech sounds in quiet. The restof the respondents gave moderate Attention (10%) to speech sounds in quiet.

- **Attend to loud Speech sounds in noise**

Table number 19 presents the child's attention to speech sound in noise.

Table # 19

Description	Frequency	Percentage
No	30	100
Minimal	-	-
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no attention (100%) to speech sounds in noise.

Auditory Feedback

- **Increased vocalization when amplification is turned on**

Table number 20 shows the Child's vocalization response when amplification is turned on.

Table # 20

Description	Frequency	Percentage
No	18	60
Minimal	12	40
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no vocalization increase (60%) when amplification is turned on. The second largest number of respondents gave minimal vocalization increase (40) when amplification is turned on.

- **Child notices own vocal production**

Table number 21 presents the Child notice own vocal production response.

Table # 21

Description	Frequency	Percentage
No	24	80
Minimal	6	20
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no response (80%). The second largest number gave minimal response (20%).

Localization sound sources

- **Search when loud environmental sound turns on**

Table number 22 presents the Child searching response when loud environmental soundsturn on.

Table # 22

Description	Frequency	Percentage
No	9	30
Minimal	15	50
Moderate	6	20
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave minimal searching response (50%) when the loud environmental sounds turn on. The second largest number gave no searching response (30%) whenthe loud environmental sounds turn on. The rest of the respondents gave moderate responses (20%) when the loud environmental sounds turn on.

- **Localization of environmental sources**

Table number 23 presents the Child's response to loud environmental sounds in quiet.

Table # 23

Description	Frequency	Percentage
No	30	100
Minimal	-	-
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no localization response (100%) to the sources.

Auditory Discrimination

- **Differentiate between sounds**

Table number 24 presents the Child's ability to differentiate between sounds.

Table # 24

Description	Frequency	Percentage
No	30	100
Minimal	-	-
Moderate	-	-
Significant	-	-
Total	**30**	**100**

The largest number of respondents gave no differentiation (100%) between sounds. Short-term auditory memory

Table number 26 presents the Child's short-term auditory memory.

Table # 26

Description	Frequency	Percentage
No sound	24	80
1 sound	6	20
2 sounds	-	-
3 sounds	-	-
Total	**30**	**100**

The largest number of respondents gave no short-term auditory memory (80%). The rest of theresponses gave 1 sound short-term auditory memory (20%).

IV. SUMMARY, DISCUSSION, CONCLUSION & RECOMMENDATION

Summary and Discussion:

The initial goal of the current study was to investigate "Auditory performance among special school hearing challenged youngsters." From the schools for hearing-impaired students, a randomsample was collected. The purpose of the study is to investigate the use of hearing aids and the therapeutic method in hearing-impaired school-aged children. To gather information, a questionnaire and interview schedule were created. The auditory abilities such as sound perception/awareness, auditory feedback, sound localization, discrimination, and short-term auditory memory will also be explored in this study.

The investigator went to the hearing-impaired school in person and observed specific students. At the time of observation, the information was noted in the schedule and also documented. Thegathered information was transformed into tabular form and then analyzed.

According to the study's tabulation, the following conclusions were made:

A group of school-age children who were deaf or hard of hearing and ranged in age from 4.5 years to 20 years were studied by Moeller et al. for their receptive language abilities. These kids showed receptive vocabulary abilities comparable to those of typically developing, deaf youngsters between the ages of 5 and 7. This study's hypothesis of considerable delays comparedto peers with normal hearing is in line with prior studies of deaf or hard-of-hearing school-age children.

Based on typical stages of auditory development, a hierarchy for the development of a listening function has been established. All conversations and educational activities involve these auditorystages. The following are the auditory stages and their definitions:

1. Perception and awareness of sound: Signal the presence or absence of sound.
2. Auditory Attention and Inhibition – Spend considerable time focusing on auditoryinformation, particularly speech.
3. Distant Hearing: Recognize sounds in the distant.
4. Localization, or locating the origin of a sound
5. Discrimination: Differentiate and recognize acoustically similar or unlike words andsounds.
6. Auditory Feedback and Monitoring – Pay attention to auditory information and, if necessary, repeat or adjust your speech to reflect the auditory model.
7. Auditory Memory: Recall and store auditory stimuli.
8. Auditory Memory Span and Sequencing – Recall auditory information of various lengths in precise order.
9. Auditory Processing: Assess auditory information cognitively.
10. Auditory Understanding-Accept knowledge from auditory sources in any circumstance.

Conclusion:

The study indicated that Total Communication and Sign Language were the most common forms of communication in schools for hearing-impaired students. There was constant use of amplification devices by the kids. The majority of the children were discovered to be receiving speech therapy at school, and the group therapy approach was being applied, but the auditory performance was not satisfactory. According to this study, hearing-impaired students in schools lacked skills in short-term auditory recall, localization of sound sources, auditory feedback, and sound perception.

Recommendation:

- Improve the auditory environment that should be offered to students at schools for thedeaf.
- Promote the use of auditory verbal therapy.
- Highlight the use of individual therapy.
- The auditory verbal therapist should set up refresher courses for teachers to inform them of the strategies that are beneficial for children's auditory development, perception, discrimination, and comprehension.

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Appendix- A

I. GENERAL INFORMATION SECTION

Name of the Child: - _____ Sex: - _____

Date of Birth / Age: -_____Age of Onset: -_____

Present Address: - _____

_____Telephone No: -_____

Present School: -_____

Mode of Communication in School: -

- Sign Language ☐
- Speech Reaching/ Lip-Reading ☐
- Auditory Approach ☐
- Total Communication ☐

Class Studding: -_____

Degree of Impairment:

Mild ☐ Moderate ☐

Moderately Severe ☐ Severe ☐

Profound ☐

Body Worn	☐	☐
B.T.E	☐	☐

Age at which the hearing device is provided: _____

Usage of Hearing Aid: -

- Consistent ☐
- Inconsistent ☐

Does your child take speech therapy services?

Yes ☐ No ☐

If Yes, Specify the therapy place

- In School ☐
- In School & In Hospital ☐
- In School & In Speech Clinic ☐

Therapeutic Approach: -

- Group Therapy ☐
- Individual therapy ☐

II. AUDITORY INFORMATION SECTION

A. Sound Perception / Awareness

Responds to loud environmental sounds in a Quiet setting.

No _____ Minimal _____
Moderate _____ Significant _____

Respond to loud environmental sound in Noise?

No _____ Minimal _____
Moderate _____ Significant _____

Respond to Speech sound in a Quiet setting.

No _____ Minimal _____
Moderate _____ Significant _____

Respond to Speech sound in Noise?

No _____ Minimal _____
Moderate _____ Significant _____

B. Sound is Meaningful

Attending a loud environmental sound in Quiet?

No _____ Minimal _____
Moderate _____ Significant _____

Attends to loud environmental sounds in noise?

No _____ Minimal _____
Moderate _____ Significant _____

Attends to Speech sound in Quiet?

No _____ Minimal _____
Moderate _____ Significant _____

Attending a speech in noise?

No _____ Minimal _____
Moderate _____ Significant _____

C. Auditory feedback

Increased vocalization when amplification is turned on?

No _____ Minimal _____
Moderate _____ Significant _____

Notices own vocal production?

No _____ Minimal _____
Moderate _____ Significant _____

D. Localization sound sources

Starts searching when loud environmental sound turns on?

No _____ **Minimal** _____

Moderate _____ **Significant** _____

Localize local environmental sound sources?

No _____ **Minimal** _____

Moderate _____ **Significant** _____

E. Auditory Discrimination

Differentiates between two different sounds?

No _____ **Minimal** _____

Moderate _____ **Significant** _____

F. Term Auditory Memory

No sound ☐

1 sound ☐

2 sounds ☐

3 sounds ☐

Appendix- B

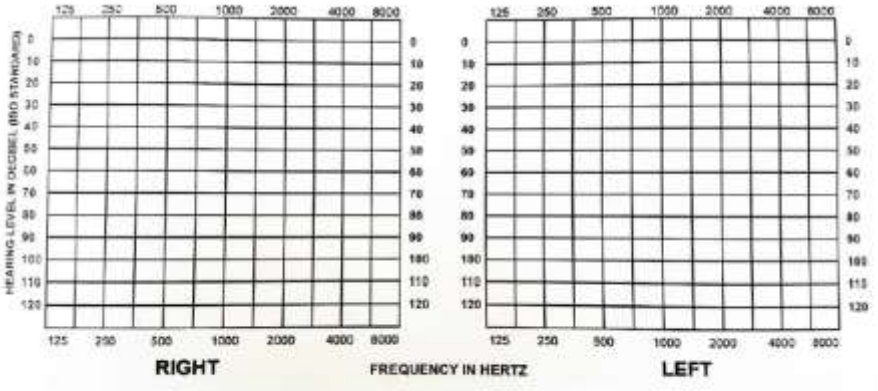
Ziauddin College of Speech Language & Hearing Sciences

Ziauddin University

Clifton Block 6, Karachi

Name: _____ **Age:** _____

Sex: _____ **Type of test:** _____



Air: R=O, L=X, Bone: R=<, L=>, Binaural sound field: □,

Remarks: