ADAPTATION, TRANSLATION AND VALIDATION OF PARENTS EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (PEACH) AND TEACHER'S EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (TEACH) IN HINDI LANGUAGE

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CERTIFICATE

This is to certify that this dissertation entitled "**ADAPTATION, TRANSLATION AND VALIDATION OF PARENTS EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (PEACH) AND TEACHER'S EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (TEACH) IN HINDI LANGUAGE**" is a bonafide work submitted as a part for the fulfillment for the degree of Master of Science (Audiology) of the student with Registration Number: 18AUD028. This has been carried out under the guidance of the faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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This is to certify that this dissertation entitled "**ADAPTATION, TRANSLATION AND VALIDATION OF PARENTS EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (PEACH) AND TEACHER'S EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (TEACH) IN HINDI LANGUAGE**" has been prepared under my supervision and guidance. It is also being certified that this dissertation has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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DECLARATION

This is to certify that this dissertation entitled "**ADAPTATION, TRANSLATION AND VALIDATION OF PARENTS EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (PEACH) AND TEACHER'S EVALUATION OF AURAL/ORAL PERFORMANCE OF CHILDREN QUESTIONNAIRE (TEACH) IN HINDI LANGUAGE**" is the result of my own study under the guidance of Dr. Geetha C., Reader in Audiology, Department of Audiology, All India Institute of Speech and Hearing, Mysuru and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysore   **Registration No: 18AUD028**

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Thanks to all those who helped me in many ways,
unknowingly

<div align="right">Rajwinder Kaur</div>

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Abstract

Over the years, there have been various attempts made to quantify the outcome of hearing aid benefits. There are both objective and subjective ways to achieve knowledge regarding the same. Amongst subjective measures, questionnaire has gained immense popularity in order to note the marked differences resulting from a hearing aid for individuals with hearing impairment. PEACH and TEACH are two such questionnaire that taps on the auditory performance of paediatric population. It has a set of questions to the parents and teachers to assess the performance of the child with hearing impaired in both quiet and noisy situation. However, its usage was limited since the availability of the questionnaire posed language and cultural barriers. The questionnaires that are translated in Indian languages are limited. This study attempted to translate and validate TEACH and PEACH questionnaires in Hindi language. The questionnaires were initially adapted with the help of Audiologists, later the adapted questionnaire was translated with the help of bilingual scholars. To validate the translated questionnaires, PEACH and TEACH were administered on 30 parents and 30 teachers of severe to profound hearing impaired children, respectively. The parents and teachers rated the performance of the children in both aided and unaided conditions. Results revealed a significant difference between aided and unaided conditions. Results also revealed that children performed better with hearing aid under quiet condition than in noise.

CHAPTER I

INTRODUCTION

Congenital hearing loss is the most common sensory impairment in children. To maximize speech, language and cognitive development of children with hearing impairment, early diagnosis and intervention of hearing loss is essential. Children who suffer from severe to profound sensori-neural hearing loss (SNHL) face difficulties in the development of spoken language and academic achievement (Nelson, Bougatsos & Nygren, 2008). They face challenges in performing day to day activities and have difficulties in acquisition of language (Duchesn, 2009). To avoid communication and speech problems, children with hearing impairment should receive a hearing aid or a cochlear prosthesis (King, 2010).

Children with hearing impairment, even after fitting with binaural hearing aids, may find it difficult to understand speech in the presence of competing noise and reverberation (Bradley & Sato, 2008; Crandell & Smaldino, 2000; Finitzo-Hieber & Tillman, 1978; Jamiesoz s& Kranjc, 2004; Wolfe et al., 2017). Due to communication difficulties in noisy environments there can be delay in speech, language, and academic difficulty; increased listening effort, and cognitive load (Ching & Dillon, 2013; Hicks & Tharpe, 2002; Bess, Gustafson & Hornsby, 2014 Moeller et al., 2007; Moeller,Tomblin, Yoshinaga-Itano, Connor & Jerger 2015). Hence, during outcome measurement, obtaining information in the presence of noise is very important. Questionnaires that tap the auditory perception in real world situations have been widely used as a part of outcome measurements.

Many researchers have documented the need for using subjective tools as effective measures to assess the outcomes of hearing aid in young children (Stelmachowicz, 1999; Arlinger, 2001). Subjective measures incorporate the application of auditory inventories/questionnaires to analyze the child's auditory and oral skills in daily listening situations. The reports of child's behavioral response given by parents are considered more reliable and representative than assessments conducted in structured settings as parents spend ample amount of time with their children in natural environment (Dale, 1991; Boudreau, 2005). In addition, it promote a professional-parent bond and also aids the parents to cater and identify the child's area of strength and requirements (Crais, 1995).

Several questionnaires are available to estimate the real life performance in children with hearing impairment such as Screening Instrument for Targeting Educational Risk (SIFTER) (Anderson, 1989), Assess auditory behaviors (Anderson & Matkin, 1996), Early Listening Function(ELF) (Anderson, 2000), Auditory Behavior in Everyday Life (ABEL) given by Purdy (2002), Parents Evaluation of Aural/oral performance of Children (PEACH) and Teacher's Evaluation of Aural/oral performance of Children (TEACH) (Ching & Hill, 2007).

Among the available tools, Parents Evaluation of Aural/oral performance of Children questionnaire (PEACH) and Teacher's Evaluation of Aural/oral performance of Children questionnaire (TEACH) developed by Ching and Hill (2007) are widely being used with school-aged hearing aid/cochlear implant children who have hearing sensitivity varying from mild to profound degree of hearing impairment.

Ching & Hill (2007) administered PEACH on 180 parents of 90 children with normal hearing and 90 children with hearing impairment. PEACH proved to be an essential and reliable tool for measuring the practical outcomes of infants and children using hearing aids and/or cochlear implants.

Emerson (2015) translated and validated PEACH and TEACH in Tamil language on children aged between 6 months to 15 years with the hearing sensitivity of moderately-severe to profound hearing impairment. The study included children using hearing aids in rural set-up. The study reported that PEACH and TEACH can be used for children to assess the improvement in auditory and communication skills in the rural set-up.

Ching et al. (2017) assessed language ability and day to day functioning of 133 children with hearing impairment. They were evaluated at 3 years of age. Everyday functioning of children was evaluated on the basis of PEACH questionnaire. Those children who had deficits in their language skills exhibited hurdles in daily functions in their life. In their opinion, it is appropriate to use PEACH as a scale to evaluate young children's auditory functioning in everyday life. The scale is observed as a dependable tool for evaluating the usefulness and efficiency of amplification for children in regular life (Ching et al., 2008).

Another study was carried by Kumar and Rout (2013) on children using cochlear implants. They concluded that there is a significant correlation of PEACH scores with language abilities measured using standardized language tools. Hence, PEACH and TEACH are reported to be very useful tools to decipher useful and meaningful information pertaining to the children's auditory performance in daily life.

1.1 Need for the study

Outcome measures that assess the performance of children using hearing devices in real world are a necessary part of rehabilitation. PEACH and TEACH questionnaires have found to be useful clinical tools for children with hearing loss ranging from mild to profound degree from any age group (Quar, Ching & Newall, 2012). The validity of PEACH and TEACH questionnaires have been assessed by many authors (Ching & Hill, 2007; Ching et al., 2013; Emerson, 2015; Kumar & Rout, 2013). Hence, these well-established PEACH and TEACH questionnaires were selected for the current study. These two scales demand active participation from the parents and teachers to read the instructions, observe their child over a period of time in real context and report the observations openly instead of limiting their answers to the mere test agenda. Hence, it is mandatory to have these questionnaires in the native language of the parents and teachers.

Several auditory inventories have been developed to evaluate the auditory skills of children and to examine the efficacy of hearing devices that have been developed for the children. Most of the inventories are developed for populations with native English language (Levinger & Ronen, 2008). The translation of material into target language is not the only step for the adaptation of test based on language and cultural differences, but it also requires conducting field tests to establish its validity and reliability (American Educational Research Association, 1985).

Hickson, Clutterbuck and Khan (2010) conducted a study on population from Australia, where the outcomes of hearing-aid were examined using the international outcome inventory (IOI-HA). There was no significant variation observed between the outcomes of the study, and similar results were depicted in the study by Cox and

Alexander (2002) using the English version. Kramer et al. (2002) and Heuermann et al. (2005) have also conducted similar studies. Thus, the above results indicate the need to form inventories/questionnaires for populations with multi-culture and linguistic diversity.

Hindi is the official language of our country and most Indian population speaks Hindi. There are no standard questionnaires for children with hearing impairment, to our knowledge, to assess the real-life outcome of hearing aids and monitor the progress in Hindi language. Moreover in India, many parents have only primary/secondary school education and hence, they are not fluent in English to understand the instructions and report the auditory behaviors in English. Thus, the need for the study arose and hence, the functional measures of PEACH and TEACH were chosen to be translated in Hindi. Further, any questionnaire developed and validated on a foreign population mostly requires changes and improvisation to be suitable for Indian population.

1.2 Aim of the study

Hence, the present study aimed to adapt, translate and validate PEACH and TEACH questionnaires in Hindi language in children with hearing impairment using hearing aids.

1.2 Objectives of the study

The objectives of the study were to-

1. Adapt PEACH and TEACH questionnaire to suit Indian population.

2. Translate PEACH and TEACH in Hindi language.

3. Validate PEACH in school going children with hearing impairment by

- comparing the scores of PEACH obtained with and without hearing aids, and by

- comparing the scores of PEACH obtained in quiet and noisy conditions.

4. Validate TEACH in school going children with hearing impairment by

    - comparing the scores of TEACH obtained with and without hearing aids, and by

    - comparing the scores of TEACH obtained in quiet and noisy conditions.

CHAPTER II

REVIEW OF LITERATURE

The interest in the area of hearing aid outcome measures had increased significantly in the past decade. This was driven by several factors including the need to document the benefit achieved by amplification and also by researchers' desire to understand the impact of hearing aid on listener's auditory performance on a long term basis (Humes, Larry, Humes & Wilson., 2004).

Outcome measures help the audiologists to identify the area that has to be modified in the service or treatment to suit the clients' needs. It provides information regarding the benefits of certain interventions and technologies to the client or caregiver. It also helps audiologists to promote data driven decision making and evaluate the performance of new and existing hearing aid technologies. Outcome measures can provide manufacturers of hearing devices with quantitative information regarding client's hearing needs and concerns. It can also help the manufacturers to track and compare provider performance over time (Beck, 2000; Humes et al., 2004).

Hearing aid benefits can be measured either subjectively or objectively. Objective measures include aided speech recognition and insertion gain measurements. Subjective outcome measurement is done with the use of questionnaires. There are several advantages of questionnaires as they are simple to administer and relatively easy to analyze. A large sample of the given population can be assessed at a relatively lower cost (Ching, 2007; Crais, 1995).

Many researchers have documented the importance of using subjective measures to evaluate hearing aid outcomes for young children (Stelmachowicz, 1999; Arlinger, 2001). The auditory inventories have been developed to assess the effectiveness of hearing aids and the auditory performance of children (Ching & Hill, 2007). Many authors have documented the importance of using subjective tools to evaluate the performance of young children with hearing impairment using hearing aids (Stelmachowicz, 1999; Arlinger, 2001). Subjective tools can provide better information regarding the daily needs of the child's auditory performance. It can help the audiologist in providing better amplification and rehabilitation. Subjective tools can provide more detailed and qualitative information regarding the amplification devices used by the children (Cox et al, 2003).

There are many inventories developed for English-speaking populations and some of them are mentioned in Table 2.1. The table displays questionnaires which are available to screen and estimate the real life performance of children with hearing impairment that have been widely used to assess the auditory performance of children. However, these inventories may not be appropriate for populations with different linguistic and cultural backgrounds (Levinger & Ronen, 2008).

Table 2.1

Questionnaire developed for Children with Hearing Impairment to measure outcomes

S.No	Measure	Purpose of instrument	Target population/ degree of HL	Respondent	Age range	Authors
1.	Screening Instrument for Targeting Educational Risk (SIFTER)	To identify risk for educational delay and further evaluation	Children with normal hearing and for children with hearing impairment	Teacher	>5	Anderson, 1989
2.	Screening Instrument for Targeting Educational Risk in Preschool children (Preschool SIFTER)	To Identify children at risk for educational delays and determine need for further evaluation	Children with normal hearing and for children with hearing impairment	Teacher	3 to 5 years	Anderson &Matkin, 1996
3.	Early Listening Function (ELF)	Obtain indication of functional use of hearing	Infants and toddlers with hearing impairment	Parent and audiologist	5 months to 3 years	Anderson, 2000
4.	Auditory Behavior in Everyday Life (ABEL)	Evaluate auditory behavior in everyday life (auditory awareness, aural/oral and social skills)	Children with mild to profound hearing loss	Parent	4 to 14 years	Purdy et al., 2002
5.	LittlEARS Auditory Questionnaire (LEAQ)	Assess auditory behaviors	Children with normal hearing and for children with hearing impairment	Parent interview	≤ 2 years	Kühn-Inacker, Weichbol, Tsiakpini, Coninx, &D'Haese, 2004

S.No	Measure	Purpose of instrument	Target population/ degree of HL	Respondent	Age range	Authors
6.	Hearing Environments and Reflection on Quality of Life (HEAR-QL-26)	Determine how a child perceives the effects of their hearing loss	Children with normal hearing and for children with hearing impairment	Child	7 to12 years	Urmansky, Jeffe & Liu, 2011
7.	Listening Inventory for Education (LIFE- R)	To identify classroom situations that provide listening challenges	Children with normal hearing and for children with hearing impairment	Child and teacher versions	6+ years	Anderson, & Spangler, 2011
8.	Children's Home Inventory for Listening Difficulties (C.H.I.L.D.)	To monitor listening skills within the home environment	Children with normal hearing and for children with hearing impairment	Parent and child, versions	Parent 3 to 12 years Child 7+ years	Anderson &Smaldino, 2000, 2012

The questionnaires that are widely used for outcome measurement in children are Screening Instrument for Targeting Educational Risk (SIFTER), Early Listening Function Auditory (ELF), Behavior in Everyday Life (ABEL), LittlEARS Auditory Questionnaire (LEAQ), Hearing Environments and Reflection on Quality of Life (HEAR-QL-26), Listening Inventory for Education (LIFE- R), Children's Home Inventory for Listening Difficulties (C.H.I.L.D.), Parent's Evaluation of Aural/Oral Performance of Children (PEACH), Teacher's Evaluation of Aural/Oral Performance of Children (TEACH) as mentioned in Table 2.1. All these questionnaires are available to screen and assess the auditory performance of children of different age groups. The screening tools help to evaluate auditory behavior in everyday life such as auditory awareness, aural/oral and social skills. The above mentioned questionnaires also help to identify risk for educational delay and whether further evaluation is required or not.

According to the literature PEACH and TEACH questionnaires have found to be useful clinical tools that can be used with children from any age group and with hearing loss ranging from mild to profound degree (Quar, Ching, Mukari & Newall., 2012). Since children with hearing aids or cochlear implants have to deal with day to day situations it is important to assess their performance in quiet as well as noisy environment. PEACH and TEACH helps to measure the outcomes of hearing aid in different situations i.e., quiet as well as noise. Parents and teachers spend a lot of time with young children and they can give more reliable information based on their observations, hence, it is useful to involve them in the assessment of auditory performance of the children (Quar et al., 2012).

2.1. Parent's Evaluation of Aural/Oral Performance of Children (PEACH)

The Parent's Evaluation of Aural/Oral Performance of Children (PEACH) was developed by Ching & Hill (2007) to evaluate the effectiveness of amplification for infants and children with hearing impairment by a systematic use of parents' observations. The questionnaire consists of 13 questions. According to the guidelines given in PEACH diary, the questionnaire uses items that depict topic areas relevant to evaluation of hearing devices but also offers flexibility for clinicians and parents to specify situations in a child's daily life that are relevant to each item. It includes questions regarding:

- Usage of device

- Discomfort due to loud sounds

- Listening and communicating in two environmental conditions (quiet versus noise)

- Usage of telephone

- Responsiveness to environmental sounds

PEACH questionnaire is a complementary tool that provides better understanding of the specific difficulties faced by the child and assists in the better adjustment of the device used. It helps in the accompaniment of the intervention of hearing aid and to verify if the rehabilitation results are being reached to the users (Moret et al., 2013). Different researchers have used PEACH to review the effectiveness of amplification devices in daily routine by getting information from the parents about the specific situations in child's daily life.

One of such study was carried by Ching and Hill (2007). They administered PEACH on 180 parents (one parent each) of 90 children with normal hearing, age ranging from 2.1 to 3.10 years, and 90 children with hearing impairment with age ranging from 4 months to 19 years. It was concluded that PEACH can be used with infants as young as one month old and with school-aged children having hearing loss with severities ranging from mild to profound degree.

Marnane & Ching (2015) studied the usage patterns of hearing aids and cochlear implants in children up to three years of age. The effect of device use on functional performance on auditory tasks in real life was investigated using the PEACH questionnaire. They concluded that device usage was significantly associated with functional performance in real life.

Another study using PEACH Persian version was done by Naghibirad, Fatahi, Hajiabolhassan and Faghihzadeh (2016). They analyzed responses of 54 normal hearing children and 30 cochlear implant users. Significant difference was seen in the scores of cochlear implant and normal hearing children. The results of the study revealed that the Persian questionnaire has appropriate validity and reliability. Also a significant difference was seen when comparing the questionnaire scores of the hearing impaired children using cochlear implants with their normal hearing peers. Hence, it can be used as a tool for assessment of oral/aural performance of the children using cochlear implants.

Various studies are available on the same line across the globe. One amongst them is the study by Vo et al. (2018). The study was carried out on Vietnamese children

with hearing impairment using solar powered hearing aids. Device inspection and observational assessments were performed by teachers using a modified Parents' Evaluation of Aural/Oral Performance of Children and an Infant Hearing Program Amplification Benefit Questionnaire (IHPAQB). The study reported that IHPABQ did not demonstrate any improvement in auditory performance. It also demonstrated that hearing improvements were noted by the modified PEACH survey. However, since the baseline was not taken the results cannot be reliable.

Meanwhile, a study by Gan, Daniel, Ridley & Barry (2018) aimed to assess the quality of questionnaires for the assessment of otitis media with effusion in children. For evaluation of auditory performance of children, they used 15 questionnaires including Auditory Behaviour in Everyday Life (ABEL), Children's Auditory Performance Scale (CHAPS), Children's Home Inventory for Listening Difficulties (CHILD), Children's Outcome Worksheets (COW), LittlEARS Auditory Questionnaire (LittlEARS), Listening Situations Questionnaire (LSQ), Otitis Media 6 (OM-6), and Parents' Evaluation of Aural/Oral Performance of Children (PEACH) etc. The performance was assessed based on eight criteria viz. conceptual clarity, respondent burden, reliability, validity, normative data, item bias, ceiling/ floor effects, and administrative burden. Authors found that ECLiPS, LittlEARS and PEACH are the most suitable ones, as they almost satisfied the criteria which were laid out in the study for the assessment. They concluded that questionnaires in otitis media with effusion could provide a useful adjunct to audiometry, as a means of assessing a child's everyday function, but further research is required to determine how they fit into the overall assessment of children with otitis media with effusion.

The literature reports of a systematic review article by Moret et al., (2013) to review on different questionnaire that are used to assess the benefits of hearing aids in children. The various questionnaires assessed were Final Hearing Aid Choice, Listening Inventory For Education (LIFE), Auditory Behavior in Everyday Life (ABEL) and Parent's Evaluation of Aural/ Oral Performance of Children (PEACH) and Teacher's Evaluation of Aural/Oral Performance of Children (TEACH). The reviewed literature poses a huge lack on the investigations done regarding validation of subjective outcomes and that there is an immense need to evaluate the effectiveness of rehabilitation, the satisfaction and quality of life and not just the communicative abilities of children with hearing impairment.

From the research, it can be concluded that PEACH questionnaire can be used as a tool to gain an overview about the auditory performance of children with hearing loss in different environmental situations. The information gathered from the questionnaire is provided by the parents, so it can be of great help to the audiologist in the rehabilitation and in improving the auditory performance of children. The questionnaire can also give us the idea about the effectiveness of amplification devices (hearing aid/cochlear implant), according to which manipulation can be done to device for the better performance.

2.2. Teacher's Evaluation of Aural/Oral Performance of Children (TEACH)

The Teacher's Evaluation of Aural/Oral Performance of Children (TEACH) questionnaire was developed by Ching & Hill (2007) to evaluate the effectiveness of amplification for infants and children with hearing impairment by a systematic use of

teachers' observations. It is designed to record how the child is hearing and communicating with his/her hearing aids/cochlear implant in the classroom settings. The questionnaire consists of 11 questions. According to the guidelines given in TEACH diary, the questionnaire uses items that depict topic areas relevant to evaluation of amplification devices but also offers flexibility for clinicians and teachers to specify situations in a child's daily life that are relevant to each item. It includes questions on the:

- Usage of device

- Discomfort due to loud sounds

- Listening and communicating in two environmental conditions (quiet versus noise)

- Usage of telephone

- Responsiveness to environmental sounds

Teachers' observations are an important tool that can be used to assess a child's auditory experience which in turn can help the audiologist to evaluate the effectiveness of the child's hearing aids and accordingly fine tune them, if required. It can also be used to track the child's performance with the use of amplification devices. Few studies have been done keeping the same interest in mind.

One such study done by Ching, Dillon, Hill and Teresa (2008) examined the effect of variations in hearing aid frequency response on real-life functional performance of children with severe to profound hearing loss. The responses were recorded using PEACH and TEACH. Results showed that the PEACH and TEACH

scales were effective in evaluating the impact of variations in hearing-aid frequency response slopes on the real-life functional performance in infants and young children who have severe to profound hearing loss. The findings supported the evaluation of the effectiveness of amplification by a systematic use of parents' and teachers' observations. A similar study was done to assess the functional performance using PEACH and TEACH questionnaire by Emerson (2015).

Emerson (2015) adapted and validated PEACH and TEACH in Tamil language for rural community questionnaires to assess their functional performance in everyday life. Sixty children with moderately-severe to profound hearing loss using hearing aids in a rural set-up were evaluated by these. Results reported that PEACH and TEACH can be used to evaluate the improvement in communication abilities of the children and it can be applied in rural communities across developing countries.

Most of the studies have been done on PEACH and very limited studies are done on TEACH questionnaire. TEACH can provide us information about the auditory performance of children with hearing loss given by the teachers. Teachers can give better details about the performance of children in the school environment. It can help the audiologist regarding the fine tuning of the amplification devices according to the classroom setting.

2.3. Questionnaire developed in Indian Languages

Different questionnaires have been translated and adapted to different Indian languages. Thammaiah, Manchaiah, Easwara and Krishna (2016) translated and adapted hearing handicap questionnaire, the international outcome inventory-hearing aids, the

self-assessment of communication, the participation scale, and the assessment of quality of life – 4 dimensions in Kannada.

Sood, Kumar, Tyagi, Varshney, Malhotra & Priya (2019) translated Hearing Handicap Inventory for Adults (HHIA) in Hindi. The questionnaire was administered on fifteen patients of unilateral sensorineural hearing loss. Authors reported that the questionnaire can be used for the assessment of the impact of unilateral sensorineural hearing loss on the quality of life.

Navdeep (2011) developed a questionnaire in English to measure hearing aid benefit for adults according to the Indian scenario. Questionnaire was developed only for adults as they are more exposed to different listening environment in daily life situations. It was administered on thirty participants in the age range of 18-50 years. The result of the study showed that the aided scores for different listening situations (quiet, noise, telephone, listening music) were higher than unaided scores. It was concluded that the questionnaire can be used to measure hearing aid benefit as a screening in outreach programs where facilities and manpower for carrying out objective evaluation are limited.

Another study was conducted by Mittal, Raj and Ramalingam (2015), wherein they developed a parental questionnaire to assess auditory, speech and language skills of paediatric cochlear implant recipients in Hindi language for the age range of 3-7 years. The questionnaire has three sections in which first section has twelve sections which assess the auditory skills of cochlear implant recipients, second section assess the language skills of the child and further; there are six subsections in second section,

which assesses the listening, semantics, morphology and syntax. The third section assesses the morphological and syntactic development of the child. The questionnaire is different from PEACH as, PEACH assesses the auditory performance of child in real life environments, provides the information regarding the performance of child in quiet and noisy situations. PEACH questionnaire is open ended and parents can provide descriptive information about the performance of the child by illustrating examples and scoring is given by audiologist. Whereas, in the other questionnaire there are close ended questions and parents have to choose appropriate answer from the options rather than providing descriptive information.

There are no standard questionnaires developed for children with hearing aid in Hindi language to assess the appropriateness of hearing aids and monitor the progress of intervention. Thus, this necessitates the need to adapt and translate PEACH and TEACH questionnaires in Hindi language, to have better understanding of the auditory performance of children with hearing impairment in different listening conditions.

CHAPTER- III

METHOD

The aim of the study was to adapt, translate and validate PEACH and TEACH questionnaires in Hindi. The method included the following stages:

1. Adaptation of PEACH and TEACH questionnaires

2. Translation of PEACH and TEACH questionnaires

3. Validation of PEACH and TEACH questionnaires

3.1 Stage 1: Adaptation of PEACH and TEACH questionnaires

Consent was taken from the authors who developed PEACH and TEACH questionnaires. The procedure of adaptation comprised of reviewing, revising and appropriately adapting the questionnaire. The questions that were not culturally, socially acceptable and which were ambiguous were removed and substituted by more relevant questions by four experienced audiologists who had a minimum of 5-6 years of experience in clinical research. This procedure then was successfully completed resulting into the adapted version of PEACH and TEACH. For example, in the PEACH questionnaire, the second question was added to include information on loud sounds. The twelfth question was changed from "how often does your child successfully use a phone" to "how often does your child understand conversation on phone" in order to remove the ambiguity of the question. Example of noisy situation was added to question number five, six, nine, tenth and thirteen, to provide better understanding to the parent about the situation. In the TEACH questionnaire, the original questions were lengthy

and difficult to comprehend and there were two variations of questions for each question. Therefore, only one question was selected which had age inappropriate examples. Examples from third, fifth and eleventh questions were removed, as the examples were age inappropriate such as cessation of sucking, increasing rate of sucking, opening eyes and eyes widening. In seventh question, words like television and cassette tape were removed, since all the schools does not have these facilities. In addition, in ninth and tenth questions, the word 'family members' was exchanged with 'classmate' because it is convenient for the teachers in school set up to observe the child's auditory performance with classmates rather than family members.

3.2 Stage 2: Translation of PEACH and TEACH questionnaires

The adapted version of questionnaires was then translated in Hindi language following the steps as discussed below:

3.2.1 Forward translation

English adapted version of PEACH and TEACH was translated in Hindi by three educated individuals who were well versed in the academic discipline and have Hindi as their first language. The translators were instructed to aim at the conceptual equivalent of a word or phrase, instead of a word-for-word translation, i.e. not a literal translation. They considered the definition of the original term and attempted to translate it in the most relevant way. Following were the instructions given to the translators:

- Translators should strive to be simple, clear and concise in formulating a question.

- Long sentences with many clauses should be avoided.

- The target language should aim for the most common audience. Translators should avoid addressing professional audiences. They should consider the typical respondent for the instrument being translated and what the respondent will understand when s/he hears the question.

- Translators should consider issues of gender and age applicability and avoid any terms that might be considered offensive to the target population.

A panel consisting of three individuals who were bilingual speakers of English and Hindi were then given the adapted and translated version of the questionnaires in order to verify certain aspects necessary for the validation purpose. The goal in this step was to identify and resolve the inadequate expressions/concepts of the translation, as well as any discrepancies in the forward translation. The completion of this process helped in developing Hindi translated version of the questionnaires.

3.2.2. Back-translation

Using the same approach as that outlined in the first step, the instrument was then translated back to English by an independent translator, who had no knowledge of the questionnaire. As in the initial translation, emphasis in the back-translation was on conceptual and cultural equivalence, and not linguistic equivalence. Discrepancies between the forward and backward translation were discussed with the participants included in the previous steps and necessary modifications were done.

The questionnaires were given to six participants (three teachers and three parents) of the target population and were asked to read, understand and interpret the questions. Participants did not report any difficulties in understanding the questions. Therefore the last stage was carried out in order to know the exact outcome of the study. The developed questionnaires are given in Appendix I and II. The final PEACH questionnaire has 13 questions and the TEACH questionnaire has 11 questions. These items include questions regarding:

- Usage of device

- Discomfort due to loud sounds

- Listening and communicating in two environmental conditions (quiet versus noise)

- Usage of telephone

- Responsiveness to environmental sounds.

3.3 Stage 3: Validation of translated questionnaires

3.3.1 Participants

The participants included for the validation of questionnaires were the teachers and parents of 30 children with severe to profound hearing impairment. The mean age of the children with HI whose parents and teachers were undertaken for the study was of 7.6 years (ranging from 5 to 13 years).

Following were the inclusion and exclusion criteria:

3.3.1.1 Inclusion criteria:

- Native language of the parents and teachers were Hindi.

- The parents and teachers of children with hearing impairment (HI) who were full-time users of hearing aids.

- Teachers who had experience of spending at least 1-2 hours daily with the child with HI in the school.

- Minimum educational qualification of the parents was tenth standard.

- The teachers had minimum educational qualification of Diploma in Education.

- The guardian of child with hearing impairment who spend more time than parents were included.

- All the children with hearing impairment had aided thresholds within speech spectrum ranging from 500 Hz to 4000 Hz in both the ears.

3.1.1.2 Exclusion criteria:

- Parents and teachers of children with any other associated problems such as Autism Spectrum Disorders (ASD), neurological problems, psychological problems were not included in the study.

- Parents and teachers of children with auditory neuropathy were not included in the study.

- Parents and teachers who had any type of communication disorder or hearing loss were not included in the study.

- Parents and teachers who had acquired hearing loss and unilateral hearing loss were excluded from the study.

Informed consent was taken from all the participants. The parents and teachers who were included in the study underwent administration of the questionnaires. The procedure for the same is discussed in the following section.

3.3.2 Administration of PEACH

PEACH translated in Hindi was administered on the parents of the participants, which is designed to record how the child is hearing, and communicating with others when using his or her hearing aids. A copy of the PEACH questionnaire was given to the parents and the guidelines were explained to the parents. The parents were requested to be as specific as they could when giving the examples of behavior as they were used to score the PEACH at the end.

Each item in the questionnaire was scored on the basis of examples given by parents, using a five-point rating scale ranging from 0 to 4. An item was given a score of zero if the child did not demonstrate auditory response or no example was given; if the behavior occurred 25% of the time or if 1–2 examples were given then score of 1 was given; if the behavior occurred 50% of the time or if3-4 examples were given, then a score of 2 was given and if the behaviors occurred 75% of the time or 5-6 examples were given a score of 3 was given. If more than 6 examples were given or if auditory behavior occurred more than 75% of the time then a score of 4 was given (Ching & Hill, 2007). The scoring was done for all the 13 items. The item scores were combined into two subscale scores, one for quiet, and one for noisy environments. The questionnaires were administered when the children were wearing the hearing aids and when they were not wearing the hearing aids.

3.3.3 Administration of TEACH

A copy of the TEACH questionnaire was given to the teachers and the guidelines were explained to help them to answer the questionnaire. The questions in TEACH were very similar to those found in the PEACH. It was used to evaluate child's auditory experience in classroom settings. The scoring was done the same way as that described for PEACH. The questionnaire was administered when the children were wearing the hearing aids and when they were not wearing their hearing aids.

3.3.4 Statistical analyses

The measures used for statistical analysis were scores of PEACH and TEACH. In order to check for normality in the distribution of the data, the Shapiro Wilk's test of normality was administered. One-sample Wilcoxon Signed Rank test and Wilcoxon Signed Rank test were done for further analysis of the data.

CHAPTER IV

RESULTS

The aim of the present study was to adapt, translate and validate PEACH and TEACH questionnaires. The first step was to adapt. The questions that were ambiguous and culturally, socially unacceptable were removed and substituted by more relevant questions. The adapted version of questionnaires was then translated in Hindi language by three educated individuals who were well versed in the academic discipline and have Hindi as their first language. The questionnaires were then translated back to English by an independent translator, who had no knowledge of the questionnaire.

The final Hindi version of questionnaires was then administered on 60 participants which includes 30 parents and 30 teachers of 30 hearing impaired school going children for PEACH and TEACH, respectively. The questionnaires were administered in two conditions for the same child i.e., with and without hearing aid. The outcomes of each questionnaire are given below. The statistical analysis was carried out using the SPSS (PASW) version 20.

The data were subjected to test of normality using Shapiro-Wilks Test of normality and the results showed that the data follows non-normal distribution ($p \leq 0.05$). Hence, non-parametric tests were carried out.

4.1 Comparison of unaided and aided PEACH scores

PEACH questionnaire provides information filled by the parents regarding the aided performance of children with hearing impaired in quiet and noise conditions. PEACH has 13 questions. However, first two questions were excluded from the analysis because those questions tapped on general information not specific to the performance of the children. Table 4.1 depicts the mean, median, standard deviation and inter-quartile range (IQR) for PEACH questionnaire. Each question was scored from 0 to 4 indicating worst to best respectively and a higher score indicates better outcome. The results shows that mean values range between 1.5 to 3.5 and the median values range between 1 to 4 for the aided conditions. The unaided scores were 0 in all the questions for PEACH.

Table 4.1

Mean, Median, Standard deviation and Inter quartile range for PEACH

Question Number	N	Mean	Median	SD	IQR
HAP3	30	3.56	4.00	0.62	1.00
HAP4	30	3.20	3.00	0.80	1.25
HAP5	30	3.16	3.00	0.91	2.00
HAP6	30	2.56	3.00	1.00	1.00
HAP7	30	2.00	2.00	1.17	2.00
HAP8	30	2.73	3.00	0.90	1.00
HAP9	30	2.30	2.00	1.05	2.00
HAP10	30	2.50	2.00	1.10	1.25
HAP11	30	2.40	3.00	0.93	1.00
HAP12	30	1.50	1.00	1.35	3.00
HAP13	30	3.56	4.00	0.67	1.00

Note. HAP- PEACH scores with hearing aid; the numeral following HAP depicts the number of question in the questionnaire; Unaided scores = 0, for all the children; Maximum possible sore each question = 4.

The scores of PEACH were analyzed using one-sample Wilcoxon Signed Rank in order to compare the total sores between two conditions i.e. with and without hearing aids. The results revealed a significant difference between the two conditions ($p <$ 0.001) for all the questions.

Table 4.2

Comparison between PEACH scores obtained with and without hearing aid using one

sample Wilcoxon signed rank test

Question Number	Median	p Value
HAP3	4.00	0.00
HAP4	3.00	0.00
HAP5	3.00	0.00
HAP6	3.00	0.00
HAP7	2.00	0.00
HAP8	3.00	0.00
HAP9	2.00	0.00
HAP10	2.00	0.00
HAP11	3.00	0.00
HAP12	1.00	0.00
HAP13	4.00	0.00

Note. HAP- PEACH scores with hearing aid; the numeral following HAP depicts the number of question in the questionnaire; Unaided median = 0, for all the children.

4.2 Comparison of PEACH scores between noise and quiet conditions

The rating of all the questions assessing the performance in quiet condition (Questions 3, 4, 7, 8, 11 and 12) were added and compared with that of noise conditions (Questions 5, 6, 9, 10 and 13)**.** Table 4.3 depicts the PEACH mean, median, standard deviation and interquartile range of total scores for quiet and noise situations.

Table 4.3

Mean, Median, Standard deviation and Inter quartile range for PEACH in noise and quiet condition

Conditions	N	Mean	Median	SD	IQR
HAPQ	30	15.46	16	4.31	6.25
HAPN	30	14.03	14	3.85	7.00

Note. HAPQ- PEACH scores with hearing aid in quiet situation, HAPN- PEACH scores with hearing aid in noise situation

The comparison of PEACH scores in noise and quiet condition was done using Wilcoxon signed ranked test. The results revealed a significant difference ($z = 4.202$; $p = 0.00$) between PEACH scores obtained in quiet and noise conditions.

4.3 Comparison of unaided and aided TEACH scores

TEACH questionnaire provide information by the teachers regarding the aided performance of children with hearing impaired in different conditions. There are 11 questions in TEACH. However, first two questions were excluded from the analysis because those questions tapped on general information not specific to the performance of the children. Table 4.4 shows the mean, median, standard deviation and inter quartile range for TEACH questionnaire. The results shows that mean values range between 1.3 to 3.3 and the median values range between 1to 4 for the aided condition. The unaided scores were 0 in all the questions for TEACH for all participants.

Table 4.4

Mean, Median, Standard deviation and Inter quartile range for TEACH

Question Number	N	Mean	Median	SD	IQR
HAT3	30	3.33	4.00	0.84	1.25
HAT4	30	2.83	3.00	0.94	2.00
HAT5	30	2.96	3.00	0.85	2.00
HAT6	30	2.23	2.00	0.77	1.00
HAT7	30	1.36	1.00	1.27	3.00
HAT8	30	1.93	1.50	1.08	2.00
HAT9	30	1.76	1.00	1.16	2.00
HAT10	30	1.40	1.00	1.24	2.25
HAT11	30	3.13	3.00	0.97	1.00

Note. HAT- TEACH scores with hearing aid; the numeral following HAT depicts the number of question in the questionnaire; Unaided scores = 0, for all the children; Maximum possible sore each question = 4.

The scores of TEACH were analyzed using one-sample Wilcoxon Signed Rank (Table 4.5) to compare the total sores in two conditions i.e., with and without hearing aids. The scores for the unaided condition were '0' for all the questions. The results revealed a significant difference between the two conditions ($p < 0.001$).

Table 4.5

Comparison between TEACH scores obtained with and without hearing aid using one-sample Wilcoxon signed rank test

Question Number	Median	*p* values
HAT3	4.00	0.00
HAT4	3.00	0.00
HAT5	3.00	0.00
HAT6	2.00	0.00
HAT7	1.00	0.00
HAT8	1.50	0.00
HAT9	1.00	0.00
HAT10	1.00	0.00
HAT11	3.00	0.00

Note. HAT- Median aided values for TEACH; the numeral following HAT depicts the number of question in the questionnaire; Unaided median = 0, for all the children.

4.4 Comparison of TEACH scores between noise and quiet condition

The rating of all the questions for quiet conditions (Questions 3, 4, 7, 8 and 11) were added and compared with that of noise conditions (Questions 5, 6, 9 and 10). Table

4.6 gives the TEACH mean, median, standard deviation and interquartile range of total scores for quiet and noise situations.

Table 4.6

Mean, Median, Standard deviation and Inter quartile range for TEACH in noise and quiet condition

Conditions	N	Mean	Median	SD	IQR
HATQ	30	11.20	10	3.99	5.75
HATN	30	9.50	8	3.56	7.00

Note. HATQ- TEACH scores with hearing aid in quiet situation, HATN- TEACH scores with hearing aid in noise situation

The comparison of TEACH scores between noise and quiet condition was done using Willcoxon signed ranked test. The results revealed a significant difference (z = 3.722; p = 0.00) in TEACH scores between the two conditions.

CHAPTER V

DISCUSSION

The present study aimed to adapt, translate the PEACH and TEACH questionnaires in Hindi language. The study also was deliberated to validate PEACH and TEACH in school going children with hearing impairment by comparing the scores of PEACH and TEACH obtained while the children were wearing hearing aids with that of unaided condition.

5.1 Comparison between unaided and aided scores of PEACH and TEACH

The processes of validity includes comparing the scores of the questionnaire with that of a gold standard measure or have a definite prior knowledge of what the results would be on a given measure (Ruscetta, Palmer, Durrant, Grayhack & Ryan, 2005). The current study included children with severe to profound hearing loss, hence, the outcome of the questionnaire in the unaided condition would be closer to '0'. In the aided condition, every question had a score closer to the maximum score. All the children had their aided thresholds within the speech spectrum. Hence, the present study is in accordance with the various other studies proving the efficiency of PEACH in assessing the outcomes of auditory performance of hearing impaired children. These studies are done in different languages therefore making the validity of PEACH stronger for clinical use.

A study by Naghibirad et al. (2016) translated questionnaire into Persian and it was adapted to meet Iranian cultural context. Similarly, Quar et al. (2012) adapted

PEACH in Malay language and administered it on 74 Malaysian children, who had normal hearing sensitivity. Levy and Sato (2015) also translated and adapted PEACH questionnaire with respect to the cultural aspects of the Brazilian population. Meanwhile, PEACH was also done on Indian population by Kumar et al. (2013) who conducted a study to examine language performance of 30 Indian children using cochlear implants. Studies also have been done in Swedish language (Brannstrom, Ludvigson, Morris & Ibertsson, 2014).

In addition, PEACH scores were noticed to be less for question number 12 in each participant as it taps the performance of children during telephonic conversation. The possible reason for such finding could be due to the limited frequency range of telephone signal because of which children with hearing impairment are unable to access this limited frequency bandwidth. It could be also due to inherent softness and distortion in the telephonic signal, lacking of supplementary visual cues (Moore, Shaw & Griffiths; 2019). Hence, the validity of the study was carried out by comparing the unaided and aided scores.

The results also revealed that the score in the unaided condition of each question of TEACH was '0' and the aided scores were significantly higher for TEACH questionnaires indicating the benefit provided by the hearing aid is close to satisfactory. The studies on the translation and validation of TEACH are few in the literature. Emerson et al. (2015) conducted a study to assess the hearing aid benefits and to evaluate the outcomes. The study translated and adapted Tamil version of PEACH and TEACH which was then administered on both parents and teachers of HI children. Ching et al. (2008) also examined the effect of variations in hearing aid frequency

response on real-life functional performance of children with severe to profound hearing loss. The responses were evaluated by using PEACH and TEACH. All these studies supported that PEACH and TEACH scales are effective in evaluating the impact of hearing aid and suitable for the evaluation of auditory performance of children with varying degree of hearing impairment.

In summary, the children with severe to profound hearing loss had better PEACH and TEACH scores in the aided condition than unaided condition. These results can be accounted for functional usage of PEACH and TEACH questionnaires. The questionnaires also tap on the challenges that the children might face in various circumstances and help in preparing to face them by appropriate training in the listening training.

5.2 Comparison of PEACH and TEACH scores between noisy and quiet conditions

There was a significant difference in PEACH and TEACH scores between noisy and quiet conditions. It was also noticed that the children performed better in quiet environment in aided condition. The possible reason is because adverse listening situations result in masking of speech signals leading to more load on cognitive and auditory mechanism. Further, environmental noise comprises of more of low-frequency noise causing the upward spread of masking (of weak sounds with high frequency and less intensity). Such studies are ample in literature which show evidence of difficulties in noisy environment due to upward spread of masking (Picard & Couture, 1985; Yasin & Christopher, 2005).

Studies have compared PEACH scores in quiet and noisy situation for name call response, verbal instructions and in conversation. They noticed that the scores for quiet and noisy situation improved with experience but scores for noisy situation were consistently lower than quiet condition (Quar et al., 2012). Waghulde, Kumar, Shora & Kabani (2019) also reported similar results. However, there is only one study reported in literature which has compared quiet and noisy situations in both PEACH and TEACH (Emerson, 2015). Emerson (2015) compared PEACH and TEACH between three groups, children with moderately-severe, severe and profound hearing loss. The overall scores were better for children with moderately-severe hearing loss but scores were higher for all the three groups in quiet condition as compared to noisy situation. These results prove that PEACH and TEACH scales are effective in evaluating the auditory performance of children in different environments.

CHAPTER VI

SUMMARY AND CONCLUSION

Questionnaires can be used as clinical tools to obtain meaningful information about children's auditory performance in real life with amplification devices. In the present study, PEACH and TEACH were adapted and translated into Hindi. PEACH is a parental report questionnaire and TEACH is a teachers' report questionnaire which evaluate the real world hearing performance in different environmental conditions. The developed questionnaires were validated in the target population by comparing the scores of PEACH and TEACH obtained while the children were wearing hearing aids with that of unaided condition.

PEACH was administered on 30 parents and TEACH was administered on 30 teachers of children with severe to profound hearing impairment. The questionnaires have a rating scale varying from 0 to 4 where the lower point depicts poor performance and higher point depicts better performance. The scores were tabulated and analyzed statistically using SPSS version 20.0.

The results revealed that the scores were better for aided condition because the audibility is better with the hearing aids and hence, improve the auditory performance of children with hearing impairment. Comparison between quiet and noise situation for PEACH and TEACH showed that there was a significant difference observed between the scores in quiet and noise situation. The scores were observed to be better for quiet situation as there will be distortions in the noisy situation that can affect the hearing of

children. However, the performance of children during telephonic conversation was reported to be lesser than other conditions for PEACH.

To conclude, the PEACH and TEACH questionnaires, adapted and translated into Hindi are also validated. Hence, PEACH and TEACH can be used as a clinical tool to assess or to monitor the child's performance in different environmental set ups in children with severe to profound hearing impairment.

6.1 Implications of the study

- The output of the study (Hindi versions of PEACH and TEACH questionnaires) can be used to obtain valid information from parents and teachers regarding the auditory performance of children with severe to profound hearing loss.

- It provides information regarding the aided versus unaided performance of the children with hearing impairment.

- The study also helps to gain information regarding the auditory performance of children in different real life environments.

6.2 Future directions of the study

- The validation of PEACH and TEACH can be done for different degrees of hearing loss.

- Reliability measurement of both the questionnaires can be done.

- Future studies can also include a control group for better comparisons of the auditory performance.

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APPENDIX I

PEACH and TEACH questionnaire

<u>Parent's Evaluation of Oral/Aural Performance of Children</u>

क्र. सं.	प्रश्न	कभी नहीं 0	शायद ही कभी 1	कभी कभी 2	अक्सर 3	हमेशा 4
1	कितनी बार बच्चा अपने सुनने का यंत्र / कोकलियर इंप्लांट लगाता है?					
2	बच्चा कितनी बार ऊँची आवाज़ से परेशान हुआ है या उसने आपको शिकायत की है? (उदाहरण के लिए: दरवाजा अचानक जोर से बंद होना, बस का हॉर्न आदि)					
3	जब आप बच्चे को शांत स्थिति में उसके नाम से बुलाते है तो क्या वह जवाब देता है?					
4	क्या आपका बच्चा शांत स्थिति में सरल निर्देशों का पालन करता है या सरल कार्य कर पाता है?					
5	क्या आपका बच्चा शोरगुल स्थिति में अपने नाम का जवाब देता है जब वो आपका चेहरा नहीं देख पता? (उदाहरण के लिए: टीवी या संगीत चालू है, 2-3 परिवार के सदस्य एक ही कमरे में या एक शॉपिंग मॉल में बात कर रहे हैं, आदि)					
6	क्या आपका बच्चा शोरगुल स्तिथि में सरल निर्देशों का पालन करता है या सरल कार्य कर पाता है? (उदाहरण के लिए: टीवी या संगीत चालू है, 2-3 परिवार के सदस्य एक ही कमरे में या एक शॉपिंग मॉल में बात कर रहे हैं)					
7	जब आप बच्चे को शांत स्तिथि में पढ़कर कुछ सुना रहे होते है तो कितनी बार वह आपकी कही बातों पर ध्यान देता है? या जब बच्चा टीवी पर कहानियाँ या गाने सुनता है कितनी बार वह अनुसरण कर पाता है?					
8	एक शांत स्थिति में आपका बच्चा कितनी बार बात करने में पहल करता है या बातचीत में भाग लेता है?					

9	शोरगुल स्तिथि में आपका बच्चा कितनी बार बात करने में पहल करता है या बातचीत में भाग लेता है? (उदाहरण के लिए: टीवी या संगीत चालू है, 2-3 परिवार के सदस्य एक ही कमरे में बात कर रहे हैं, बाजार में आदि)					
10	आपका बच्चा कितनी बार समझ पाता है की आप क्या कह रहे है जब आप कार/ बस/ ट्रैन में होते हैं?					
11	आपका बच्चा कितनी बार लोगों को बिना देखे उनकी आवाज़ से पहचान लेता है?					
12	आपका बच्चा कितनी बार फोन पर बातचीत को समझता है?					
13	लोगो की आवाज़ के अलावा आपका बच्चा कितनी बार अन्य आवाज़ों पर प्रतिक्रिया करता है? (उदाहरण के लिए: दरवाज़े की घंटी, दरवाज़ा खट खटाने आदि)					

APPENDIX II

Teacher's Evaluation of Oral/Aural Performance of Children

क्र. सं.	प्रश्न	कभी नहीँ 0	शायद ही कभी 1	कभी कभी 2	अक्सर 3	हमेशा 4
1	कितनी बार बच्चा कान की मशीन/कोकलियर इंप्लांट लगाता है?					
2	पिछले सप्ताह में बच्चा कितनी बार ऊँची आवाज़ से परेशान हुआ है या उसने आपको शिकायत की है? (उदाहरण के लिए: दरवाजा अचानक जोर से बंद होना, ड्रम की आवाज़ आदि)					
3	क्या बच्चा एक परिचित आवाज़ या उसके नाम का जवाब देता है जब वह शांत स्थिति में आपका चेहरा देखने में असमर्थ होता है? (उदाहरण के लिए, वह मुस्कुराते हुए, अपना सिर घुमाकर या आपको मौखिक रूप से जवाब दे सकता है)					
4	जब आप बच्चे से शांत स्थिति में एक साधारण प्रश्न पूछते हैं (उदाहरण के लिए: आपका पैर कहाँ है?) या एक साधारण कार्य करने के लिए कहते हैं (उदाहरण के लिए: देखो, ताली बजाओ,आदि) तो क्या वह आपको पहली बार पूछने पर जवाब देता है?					
5	क्या बच्चा एक परिचित आवाज़ या अपने नाम का जवाब देता है, जब वह शोरगुल स्थिति में आपका चेहरा देखने में असमर्थ होता है? (उदाहरण के लिए: समूह गतिविधि के दौरान, खेल के मैदान में, खेल के दौरान, जब अन्य बच्चे कक्षा में बात कर रहे होते हैं, आदि)					
6	जब आप बच्चे से शोरगुल स्थिति में साधारण प्रश्न पूछते हैं (उदाहरण के लिए: आपका पैर कहाँ है?) या साधारण कार्य करने के लिए कहते हैं (उदाहरण के लिए: देखो, ताली बजाओ,आदि) तो क्या वो आपको पहली बार पूछने पर जवाब देता है? (शोरगुल स्तिथि का उदहारण: समूह गतिविधि के दौरान, खेल के मैदान में, खेल के दौरान, जब अन्य बच्चे कक्षा में बात कर रहे होते हैं, आदि)					

7	जब आप बच्चे को कहानी सुनाते हैं, तो क्या वह कहानी पर ध्यान देता है या उसका अनुसरण करता है? (उदाहरण के लिए: बच्चा कहानी के बारे में सवाल पूछता है, आपके सवाल का जवाब देता है, आपके साथ कहानी पर चर्चा करता है, आदि)					
8	बच्चा आपके साथ या सहपाठियों के साथ शांत स्थिति में कितनी बार बात करने में पहल करता है या बातचीत में भाग लेता है? (उदाहरण के लिए: क्या बच्चे को बार बार दोहराव की ज़रूरत पड़ती है, क्या बच्चा उस विषय पर उचित प्रतिक्रिया देता है, क्या बच्चा बातचीत को सुन पाता है)					
9	बच्चा आपके साथ या सहपाठियों के साथ शोरगुल स्थिति में कितनी बार बात करने में पहल करता है या बातचीत में भाग लेता है? (उदाहरण के लिए: क्या बच्चे को बार बार दोहराव की ज़रूरत पड़ती है, क्या बच्चा उस विषय पर उचित प्रतिक्रिया देता है, क्या बच्चा बातचीत को सुन पाता है)					
10	यदि कोई सहपाठी या आप शोरगुल स्थिति में बच्चे को बुलाते है, जब वह आपका चेहरा देखने में असमर्थ होता है, तो क्या वह पहचान पाता है कि कौन आवाज़ लगा रहा है (उदाहरण के लिए: व्यक्ति का नाम बताये या कहें "...", दरवाजे पर है)					
11	पिछले सप्ताह में, लोगो की आवाज़ों के अलावा बच्चे ने किन अन्य आवाज़ों पर प्रतिक्रिया दी है या उन्हें पहचान पाया है? (उदाहरण के लिए: दरवाज़े का बंद होना या फर्श पर कुछ गिरना या जब स्कूल की घंटी बजती है, तो आवाज़ को ढूँढना या आवाज़ की नक़ल करना या उसका नाम देना, आदि)					