ROLE OF HEARING AIDS IN THE REHABILITATION OF HEARING IMPAIRED

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(Inner title page)

Topic

Role of hearing aids in the rehabilitation of hearing impaired

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ABSTRACT

Present study constructs to see “the roles of hearing aids in the rehabilitation of HI Twenty subjects were used”. Questionnaires were administered ‘T’ test’ was applied to calculate the results. It showed that the hypothesis of the test stands good i.e. “hearing aids play a role in the rehabilitation of HI” Results are discussed. This supports previous findings and existing theoretical frame work till know.

(Acceptance by the viva voce committee)

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Viva voce committee

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I thank Dr. Mamood Mazhar, my husband, for guiding my thinking on the topic, and remained helpful on research preparation".

Fatima

(To he separately to the department at the time of submission of thesis)

FORWARDING SHEET

The thesis entitled role of hearing aids in the rehabilitation of HI

Has been completed under my guidance and I am satisfied with the quality of student's research work

Date_____ _____

(Name and signatures of the adviser)

(LAST PAGE OF THE THESIS – ONLY ONE PAGE)

RESUME

TITLE OF THESIS ROLE OF HEARING AIDS IN THE REHABILITATION HI.

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CONTENTS

CHAPTER NO I

1.1. INTRODUCTION

Current research is tried to find out relationship of hearing aids in the rehabilitation of hearing impaired, whether hearing aids play a role in the rehabilitation of hearing impaired. If they do how? How we know their role in the rehabilitation of hearing impaired. As some physician believed they are "vital" and first step in rehabilitation planning. We will talk all these entire questions one by one in this research report.

1.2 RESEARCH PROBLEM

Present research is designed to see any relationship of hearing aid wearing and rehabilitation of the HI. The topic is a stated as role of hearing aid in the rehabilitation of children with hearing impairment.

1.3 PROBLEM STATEMENT

What role having aid play in the rehabilitation of hearing impaired?

1.4 HYPOTHESIS TO BE TESTED:

The hypothesis of research could be given as "hearing aids play a vital role in the rehabilitation of hearing impaired"

1.4.1 Operational definition of concept:

1.4.2 Rehabilitation

Clear them, repair them replace battery could use them safely and could independent; there edibility level in every day life after fitting of hearing aids'.

1.4.3 Hearing impaired

Means a person have impaired hearing which could be categorized as:

1.	Mild	27-40 dB
2.	Moderate	41-55 dB
3.	Moderately sever	56-70 dB
4.	Sever	71-90 dB
5.	Profound	91-above dB

1.5 AIM AND OBJECTIVE

1. To find out role of hearing aids in the life of hearing impaired person.
2. To find out extended of which hearing aid play role in every day life situation
3. To how extend peoples find their difficulties or easy to loop with hearing aid in daily.
4. whether maintenance of hearing aid is easy, is the eyes of hearing impaired,
5. To find out how hearing impaired respond to hearing aids in real life situation

1.6 SIGNIFICANT AND PURPOSE OF STUDY

To see whether hearing aids improve listening level. To see whether they improve social concepts. To use whether they improve house-hold functioning. Make it able to look after the child. To see role of hearing aid in their meeting with other person. To see whether hearing impaired learn to keep hearing aid day and night time. To see whether they could replace their batteries, could wear them properly, could control their volume and adjust them accordingly to their need. To see whether hearing aid are not a source of embarrassment in HI i.e. they accept it as use full tool or part and partial in every day life.

1.7 INSTRUMENT USED

1.7.1 Questionnaire

A questionnaire is a set of carefully selected and ordered questions prepared by an investigator to seek factual information from respondents or to find their opinion, attitude or interest. Some authors restrict the use of the word questionnaire to a set if questions seeking factual information whereas those seeking opinion are called opinionaire and those dealing with attitude of the respondent are called attitude scale. However, it is generally agreed that isolating specific questions for the consideration of respondents tends to objectify, intensify and standardize their observations.

1.7.2 Forms of Questionnaire

You can construct questions in the form of a closed open, pictorial and scale item. You can utilize one type of questionnaire exclusively or a combination of them when structuring your questionnaire. The nature of the problem and the character of the respondents determine which form or forms will most likely supply the desired data.

1.7.3 Closed form

Closed form of questionnaire usually consists of a prepared list of concrete questions and a choice of possible answers. To indicate his answer, the respondent simply marks yes or no, or checks one or more items from the list of answers. Often an alternative “Do not know” is provided in items seeking opinion on highly controversial matters.

For example.

Do you think that a person known for his strong views against maintenance of peaceful atmosphere in educational institutions should be allowed to make a speech in your city on this subject?

Yes

No

Do not know

Sometimes respondents are asked to rank a series of statements/reasons/factors, etc., in the order of their importance or interest. An example is given below:

Why did you choose to do your M.A. in EPM at this university? Kindly indicate three reasons in order of their importance, using 1 for the most important, 2 or the second mist importance and 3 or the third most important.

Convenience of transportation.

Advice of the friend

Reputation of institution

Expense factors

Scholarship aid

Other (please specify)

Closed from questionnaires are easy to fill out and help in keeping the respondents mind focused on the subject, However, they often fail to reveal the respondent's motives (why he answers as the does), and do not always get information of sufficient scope and depth, and may not discriminate between finer shades of meaning. Fixed alternative responses may make respondents take a stand on issues about which

they have not crystallized opinion or may force them give answers that do not accurately express their ideas.

Let us examine the following items from a questionnaire sent to eminent educationists for the country;

There should be no restriction of the expression of opinion by student unions on any political issue. YES/NO.

All English medium institutions should be closed forthwith. YES/NO

Obviously only proponents or opponents of student union and English medium institutions could answer these questions in yes or no. Moreover, one would be benefited more from a detailed statement on the different aspects of the issues involved from eminent educationists.

In spite of the above shortcomings of the closed forms of questionnaire, it is an entirely satisfactory tool for gathering certain types of information. Moreover, it is easy to fill up, takes little time, keeps the respondent on the subject, is relatively objective, and is fairly easy to tabulate and analyze.

B Open form

Rather than forcing respondents to choose between rigidly limited responses, the open form, or unrestricted type of questionnaire calls for a free response in respondent's own words. For example, the following open-form items seek the same type of information as close-form items in para 2.4 and 2.6 above.

Why did you choose to do your M.A. in EPM in this university?

What policy should be adopted about the unrestricted expression of opinion on political issues by the students unions?

What should be done with the English medium institutions which may want to be closed down?

Note that no clues are given. The respondents are free to express their views. This allows for greater depth of response by the respondents, who may reveal their frame of reference and possibly the reasons fro their responses. Since it requires greater effort on the part of the respondent, it is difficult to get back the filled up questionnaires in large proportion. This type of item is sometimes difficult to interpret, tabulate and summarize in the research report.

A special type of open-ended question is the funnel. Actually this is set of question directed towards getting information on a single with a broad question and narrows down progressively to the important specific point.

Another form of funnel starts with an open general question and uses follow-up an specific type of closed questions. After asking the broad general question of policy about students union, the questionnaire may include the following;

Prevent all demonstrations outside the premises of the institution Yes / No

Prevent demonstration that is likely to strain our relations with some foreign country Yes NO

Prevent demonstration outside foreign embassies Yes NO.

This instrument has some disadvantages. For Example, when respondents answer general question and have no clues to guide their thinking, they may unintentionally omit important information or fail to note sufficient details. If subjects are not highly articulated and willing to give considerable time and critical thought to questions, they cannot provide useful data. If they were capable of providing pertinent information their

detailed and complex answers may create problems. However, if you frame, write and use these questions properly, these disadvantages can be minimized.

Open-ended questions are flexible they have possibilities of depth and have the capability to encourage cooperation and achieve rapport, and to make better estimates of respondent's true intentions, beliefs, and attitudes. The responses to open-ended questions can suggest you the possibilities of relations and hypotheses. Respondents will sometime give unexpected answers that may indicate the existence of relation not originally anticipated by you in the development of questionnaire.

1.7.4 Construction of a questionnaire

Questionnaire is a popular research tool because it is easy for you to ask questions. But asking questions to obtain precise and reliable data is not an easy job. You are often amazed when respondents draw different meanings from questions that you thought were perfectly clear. You may be resented when your colleagues point out biases in the wording or structuring of your questionnaire, which seems absolutely objective to you. Following are some of the steps that you should take while constructing questionnaires.

Have you thoroughly explored your hypothesis, experience, literature and other questionnaires so as to frame questions stated in crystal clear, simple language and sharply focused in meaning? Are subordinate questions asked or sis an exhaustive list of alternative choice provided so as to explore various aspects of decisive answers? Are the questions framed to elicit specific answers? These are the questions, the answers of which help you decide what information is needed, which questions are to be selected and then draft and review them.

Ordering of questions

Are items placed in psychologically or logically sound sequence sample, interesting, neutral questions preceding more difficult, crucial or personal ones and those that establish a frame of reference or provided keys to recall before those asking for detail is a smooth transition made from one group of questions to the next? Positive answers to these questions will help you order the questions on technically sound basis.

Designing the directions and format

Are clear and complete directions given concerning the type and scope of information that is wanted? Are the categories, format and directions designed to elicit accurate and unambiguous answers to require a minimum of respondent's time? These are the questions which help in designing directions and format for the questionnaire.

Eliciting honest replies

Are directions and questions words and orders so as to remove any fears, suspicions, embarrassments or hostility on the part of the respondent? If personal questions are asked, is a guarantee of anonymity or assurance that responses will be held in strict confidence given? Are any questions colored or phrased so as to elicit replies that will support the researcher's beliefs? Are respondents asked fro information concerning subjects about which they have little or no knowledge? Are specific questions asked in order to check the truthfulness or answers to general questions? Are parallel questions asked in order to check consistency of answers? The satisfactory answers to all these questions can be sought if the following criteria of question-writing are strictly observed.

1.7.5 Criteria of Questions-writing

Criteria or precepts of question-writing have been developed through experience and research. Some of the most important criteria are given below in the form of questions. Brief comments are appended to the questions.

Is the question related to the research problem and the research objectives?

Except for factual and sociological information, all the questions of a questionnaire should have some research problem function. This means that the purpose of each question is to elicit information that can be used to test the hypothesis of the research.

Is the question right and appropriate?

Some information can best be obtained with the open-ended questions, for example, reasons for behavior, intentions and attitudes, etc, certain other information; on the other hand, can be more expeditiously obtained with closed question. If all that is required of a respondent is his preferred choice of two or more alternative, and these alternatives can be clearly specified, it would be wasteful to use open-ended questions.

Is the question clear and unambiguous?

Certain precepts help the question-writer to remove ambiguity. Questions that contain more than one idea to which a respondent can react should be avoided. A question like “Do you believe that the administrative aims of the modern high school and the teaching methods used to attain these aims are educationally sound?” is an ambiguous question, because the respondent is asked about both administrative aims and teaching methods in the same question. Also avoid ambiguous words and expressions. A question, “Do you think the teachers of your school get fair treatment?” is ambiguous, because

"fair treatment" might refer to several different terms of treatment. The word "fair" too can mean "just," "equitable," "not too good, "impartial" and "objective. Moreover, long question tend to be ambiguous, because the respondent may get lost. His attention may be diverted towards a non-essential part of the question. The entire question, however, may be long because it may be necessary to supply adequate informational context but the actual question should be focused on one idea.

Is the question suggestive?

Suggestive questions lead to answer …. As such, they threaten validity. If you ask a person: "Have you read about the local school situation?", you may get a disproportionately large number of "Yes" responses.

Does the question demand knowledge and information that the respondent does not have

To counter the invalidity of response due to lack of information, it is wise to use information filter questions, For example, before asking a person what he think of UNESCO, first find out whether he knows what UNESCO is and means. Another approach is possible. You can explain UNESCO briefly and then ask the respondent what he thinks of it.

Does the question demand personal or delicate material that the respondent may not like to divulge?

Special techniques are needed to obtain information of delicate, or controversial nature from a person. Establishing rapport is one such technique. When questioning about something that is socially disapproved, show that some people believe one way another believe another way. Use 'soft' rather than 'hard' expressions.

Is the question loaded with social desirability?

People tend to give responses that are socially desirable, responses that indicate or imply approval of actions or things that are generally considered good. You may ask a person about his feelings towards children. Everybody is supposed to love children. Unless you are very careful, you will get a stereotyped response about children and love. Also, when you ask a person about his voting, you must be careful since everyone is supposed to vote. If you ask respondents about their reactions to minority groups, you again run the risk of getting invalid responses. Most educated people, no matter what their true attitude4s, are aware that prejudice is disapproved. A "good question" then, is one in which respondent are not led to express merely socially desirable sentiments. St the same time, you should not question a respondent so that he is faced with the necessity of giving a socially undesirable response.

1.7.6 Administration of the Questionnaire

Before the final form of the questionnaire is prepared for distribution among the respondents it should be tried out or pre tested for the purpose of validation in terms of practical use. The pretest should be done on a few prospective respondents and the responses be tabulated. This would indicate whether the answers can be tabulated satisfactorily and whether answers are forthcoming to crucial questions. The pre testing would probably indicate need for revision of certain questions, deletion of some questions not yielding useful information and addition of some new questions.

After pre testing and revision the questionnaire is ready for distribution among respondents, the questionnaire can be presented to respondents in two ways: through direct contact in a face-to-face situation or through the mail.

Direct contact

When you personally present the questionnaire to respondents, you can explain the purpose and significance of the study, clarify points, answer questions that arise, motive respondents to answer questions carefully and truthfully, and obtain new partial responses and refusals. But bringing a group together, to fill up a questionnaire, is often difficult and meeting members individually may be extremely costly and time-consuming, hence it is often necessary to send questionnaire through the mail.

1.7.7 Steps for better response through Questionnaire

Collecting data through mailed questionnaires requires special care. Unplanned or hurriedly mailed questionnaires yield disappointingly low returns which may even make it impossible to complete the research. The following steps are likely to ensure better return.

Choice respondents carefully

It is important that you send the questionnaire only to those who possess the desired information those who are likely to be sufficiently interested to respond conscientiously and objectively. A preliminary card, asking whether the individual would be willing to participate in the proposed study, is recommended by some research authorities. This will not only be a courteous approach, but a practical way of discovering those who will cooperate in furnishing the desired information. A greater proportion of returns sis possible when the original request is made to be the administrative head of the organization, rather than directly to the person who had the desired information. It facilitates the returns.

Be sure to include a courteous, carefully constructed cover letter to explain the purpose of the study.

The letter should promise some sort of inducement to the respondent for compliance with the request. In educational circles a summary of questionnaire results is considered an appropriate reward, a promise that should be scrupulously honored after the study has been completed. The covering letter should assure the respondent that delicate information will be held in strict confidence. It is usually suggested that tow copies of the questionnaire be sent to respondents along with a stamped, addressed return envelop. It will facilitate the respondents to retune one copy and keep the other one in his own record. To omit this courtesy would be practically t guarantee that many of the questionnaires would go into the waste basket.

If the desired information is delicate or intimate in nature, consider the possibility of providing for anonymous responses

The anonymous instrument is most likely to produce objective responses. There are occasions, however, for purpose of classification, when the identity of the respondent is necessary. If a signature is needed, it is essential to convince the respondent that his responses will be held in strict confidence, and that his answers will, is no way, jeopardize the status and security of his position.

Follow-up procedure

Recipients are often slow to return completed questionnaires. To increase the number of returns, a vigorous fellow-up procedure may be necessary. A courteous post-cart, reminding the recipient that the completed questionnaire has not been received, will bring in some additional responses. This reminder will be effective with those who have just

put off or forgotten to fill up or mail the document. A further step in the follow-up process may involve a personal letter of reminder. In extreme case a telegram, phone call, or personal visit obtain return of at least 80 to 90 per cent or more.

1.7.8 Use of Questionnaire

Following are some of the users of questionnaires.

Some authors include sampling among the tools of research. In view of the importance of sampling techniques, unit 7 has been exclusively devoted for it. Questionnaires may be relatively inexpensive to administer, since they are completed big respondent without any interer present.

They can be distributed to respondent quickly and inexpensively through the mail or they can be administered to an assembled group of people at one time

They often can be designed to maintain respondents anonymity, thus respondents are reassured that their responses will not be used against them in anyway. Hence they will respond with greater honesty than might otherwise be the case.

They can be standardized, so that all respondents are given exactly the same printed questions to answer. One the contrary, in an interview, a respondent's answer may be influenced by the way, the interviewer asks questions.

1.8 SAMPLING

The primary purpose of research is to discover principles that have universal application. Most of the researches use a small proportion of a population for application of treatment, collection of data for analysis and drawing of conclusions. This is done for a number of practical considerations. Some populations may be so large that measurement of their characteristics would be too expensive and time consuming. In case of very large

populations, like all children of primary schools in Pakistan or all vehicles registered in the country, collection of data might take so long that by the time the investigator has completed his study, the population itself might under--go change. In that event the conclusion drawn from the study would not be true in respect of the hanged population whose composition might have been affected by increased rate of new entrants, and lowered rates of repeators and drop-outs.

While in some cases it may seem feasible to obtain the information by taking a complete enumeration of census of the aggregate, in most other, the process of sampling would make it possible to draw valid inferences or generalizations or the basis of data collected from a relatively small proportion of the population. The extent to which we can do this (make generalizations or draw inferences) with any accuracy depends on the adequacy of the sample.

The researcher is not alone in his reliance on sampling. Each one of us makes use of sampling in his every day life. Before buying peanuts from a vendor we take out one or two peanuts and peel off the shell to see whether it has healthy looking nuts and then taste it to test whether it has been properly fried. If we are not satisfied with the quality of the contents of these samples peanuts we move off.

Similarly our opinions of institutions and individuals are often based on samples of our experience with them. The inferences drawn by us in every day life on the basis of samples may not always be true because we do not make deliberate efforts to obtain good samples. The researcher on the other hand makes use of the sampling techniques to draw samples which are

Randomly selected

Representative

Sufficiently large and

Controlled or extraneous variables

1.8.1 Type of Samples

Samples can be broken down into basic types: nonprobability and probability. The basic difference between the two is that in the former, there is no way of estimating the probability that each individual has an equal chance of becoming a part of the sample. The following examples would explain the difference. Suppose an investigator conducting a study of class V students of Sheikhupura city approaches the headmasters of primary schools and collects data from schools where the headmasters make available their students. He goes from school to school and obtains data till he manages to reach his target of 250. This is an example of a nonprobability sample. If, on the other hand, he obtains a complete list of all students enrolled in class V in all schools of Sheikhupura city, puts their names on separate slips, places all slips in a drum/container and then draws 250 slips, one by one, after rotating or shaking the container repeatedly, he has a probability sample. This in known as a probability sample because each student ahs an equal chance of being included in the sample.

Probability sampling

Probability sampling is characterized by an systematic and methodical selection of samples form the population such that each individual in the population has an equal probability (chance) of being included in the sample. For example, if there are ten students in a class (S_1, S_2, S_3, S_4, S_5, S_6, S_7, S_8, S_9, S_{10}) and a sample of two student in to be drawn, one may make five pairs of students so that all students are included only once

in a pair. A large number of combinations of five pairs are possible and any pair could be taken. Say, the five pairs are: (S_1, S_2), (S_3, S_4,), (S_5, S_6,), (S_7, S_8), and (S_9, S_{10}). Now if one of these pairs is selected through a draw, it would be obvious that all these pairs has an equal chance of being selected. Thus each pair had 20 per cent (100 by 5) chance or a probability of .20 of being picked up. It should be noted that there is neither any bias in the drawing of probability samples nor is the drawing of sample left to chance or convenience.

1.8.2 Need of and advantages of sampling

Need for sampling

As emphasized earlier, research is directed toward learning about populations. Gathering data about large and widely dispersed population is often note feasible and is always costly and time consuming. Consider such areas as eating habits, child rearing practices, reading habits of students, house hold budget or various income groups incidence of divorce in the country etc. Reliable information about a large number o very vital subjects would not be available, had complete enumeration of total population been the only method available to us. Fortunately characteristics of large and wide population can usually be determined by selecting samples that are small relative to the size of the population, if proper sampling systems are used.

Advantages of sampling

The principal advantages of sampling as compared with complete enumeration are discussed below.

Reduced cost. If data are obtained from only a small proportion of the total population, expenditure is smaller that if a complete census is attempted. With large

population adequately accurate results can be obtained from samples that represent only a small fraction of the population, say on in a thousand or one in thirteen hundred. Thus the saving in the cost of data collection alone is considerable.

Greater speed. For the same reason, the data could be collected and systematized more quickly with a sample than with a complete count. The speed with which a sample survey can be completed is a vital consideration when the results are urgently needed.

Greater scope. While carrying out complete enumeration, it may not be feasible to obtain detailed information and the scope may have to be limited. In certain enquires highly trained personnel may be required for collection for the data which may make complete enumeration with sufficient details.

Greater accuracy. Well trained personnel can gather data under careful supervision when the volume of work is reduced. As such a sample may yield more accurate results than complete enumeration done by poorly trained personnel with little or no supervision.

1.9 STANDARD PROCEDURE

1.9.1 Subject

20 subjects are selected from a scanning audiological clinic. All near hearing aids and have secure perfound hearing loss. Random sampling method is used. Subject are chose randomly from clinic life. 4-5 subject are chosed from week.

1.9.2 Procedure

1. Each subject was interviewed carefully. All questionnaires were filled by research. The subject is asked all questions one by one. There responses are noted down carefully on questionnaire. Each response is

either YES or NO and brief description of or explanation of response to the question or rather verification of response.

2. Subjects were first asked to sit down comfortably. A brief description about research was given. “This research is about usefulness of hearing aids in daily living. You have to tell about
   i. Effectiveness of hearing aid in daily living
   ii. Carrying of hearing in every day life “if it is easy”
   iii. If it is easy to purchase or maintain hearing aid
   iv. If it improve listening!
3. After brief introduction, the subjects were asked about questions written in questionnaire one by one. They were encouraged to give true reply. They were also asked to elaborate their answer or simply justified their answer in two or four of few words.
4. It is difficult to administrated questionnaire top deaf population. It take time and efforts. It is difficult to the deaf. Howere they tried to cooperate as far as they can. The researcher use.
   i. “Sign language” 4 Loud voice
   ii. Lip reading
   iii. As well as written questionnaire it self to convey message to the hearing impaired.
5. It was taken 2-4 time repetition of “questionnaire” questions until the subject took a hint of question. Thus it was taken more than half hour

with a patient for complete filling of questionnaire. Twenty questions took more than thirty day.

6. Time of the research was divided into approximately 4 weeks. On each week 4-5 questionnaire were filed the name of the subject was chosen randomly from clinic file. Only available subject was chosen the important characteristic common to all subjects are.
    i. All were hearing aids at the time of interview.
    ii. They were invited to take part in the research as routine visit
    iii. They came on the time of Clinic i.e. 4pm onward.
    iv. Only few (2-3 subject) refused. Most of them came willingly.
    v. They were all patients at clinic.
    vi. They show interest and try to play active part in research work.
    vii. They were usually with some relative or friends.
    viii. All of them are severe to profound deaf.
    ix. They show full cooperation
    x. It was took more than 4 week to complete the research.
    xi. They are all grown up and mature (No children took part in research study).
7. it was took ten to fifteen mints to establish “rapport” with the patient. Rapport means Developing positive or communicable attitude thus during the small meeting with patient the subject should feel at home. He must feel that he is with researcher; working for him. The patient

must feel that research could under stand their responses know their feeling and better judge. They must convey.

i. Epathy
ii. Geniunness
iii. Positive attitude

Towards researcher and research they must know that they are fighting against deafness and its short coming.

8. The subject must be a regular user of the hearing aids. They must start using hearing aid for more than six months. So that they could express.

i. How they find hearing aid in their house, in their usual routine.
ii. Could tell how to use hearing aid and how to take good care of it.
iii. "Could give judgment" How it helpful in listening.
iv. Must be aware enough to tell it role in rehabilitation.

9. A brief bio-data of the subject was taken. The boi-data on questionnaire is consisting of.

i. Name
ii. Type of hearing aid use
iii. Age
iv. Place of living

During Interview session other in formations were also taken such as:

v. Duration of Hearing use
vi. Any other complication other than hearing loss.
vii. Level of sociability and level of social adjustment of client.

10. Filling of research questionnaire is a **unique experience.** The subject were cooperative. They shown positive response towards research and try to give accurate answers. The interview was completed in one sitting. The subject show complete understanding of the procedure and feel free to talk. If they could not understand they ask to read themselves and also could communicate their problems. Questions were simple, only on few question the researcher feel the subject were tried to give as fair answer as they could.

CHAPTER 2

2 REVIEW OF LITERATURE

2.1 PREVIOUS RESEARCH FINDINGS

Many previous researchers emphasized the importance of hearing aid in the rehabilitation of hearing impaired. Source of these research finding or issues are discussed as under.

1 As hearing aids found to be very effective in rehabilitation and treatment of deafness: these are emphasized these days. Andrew Mccombe (2000) in his research finding "the hearing aid revolution point out that now a days peoples demand least expensive and less time consuming hearing aids. He also pointed out that there are increases in the use of hearing aid through out the world. (P-13-14) ENT NEWS vol. 8 no. 6 jan / feb 2000

2 Robert. E. Sandin (2000) In this research report "Digital hearing aid" Hype hoax o hope? Pointed out simple to that above. "the hearing health professional whether physician, audiologist or dispensers should be current with technological advances in hearing aids to offer guidance to those needing hearing aid amplification. Unquestionable, there has been much myrical associated with hearing aids. Nonetheless, the do offer significance benefit to those with hearing impairment portend great hope and promise for the future as we gain greater insights into the functioning of the human auditory system. (p16 ENT news vol.8 No.6 Jan. Feb. (2000)

3 Andrew Mccombe (2000) In an "Interview with James Strachen Rind Chief Executive explained" "importance of fitting and education of hearing aids" He pointed out that these activities are more itself an his words.

We would say that fittings and guidance are at least as important as the instruments fitted. Learning to use aid is no difficult and their implementation would lead to more precise customized fitting and a more consistent standard of fitting across the NITS (p 19…. ENT news Vol. 8 No. 6 Jan. Feb. 2000).

4 Howard Rocky Stone (2000) " A consumer speaks frankly" Pointed out that even deaf peoples recommended hearing aids as device for improving your conversation and understanding towards this word. (P-22-23) vol. 8 no. 6 jan /feb 2000

5 Stuart Gatehouse (1999) in "The Glasgow hearing aid benefit profile a research report point out evaluation of hearing aid fittings and services" This research consist of four questions which are than sub divided into six. By question or six question, these six sub questions are rated on six point scale i.e. (0 – 5) (^{0} N/A , ^{1} never, ^{2} about ½ time , ^{3} about ½ of the time, ^{4} about ¾ of the time, ^{5} all the time) This scale is repeated differently while considering each sub question. Thus four main questions give rise to 24 sub questions and each sub question is rated by six-pointed scale 0=No and 1=Yes e.g.

Q=does this situation happened in your life?

Q=having a conversation with several people in a group. 0 = No 1= yes.

Sub question e.g.

How much difficulty do you have in this situation? And the rating scale use is e.g.

N/A

No difficulty

Only slight difficulty

Moderate difficulty

Great difficulty

Can not manage at all

The results show that hearing aids make a difference in their life. Uses of hearing aids improve their living standards. Most of them tell that hearing aids helps in listening but certain extraneous variable such as how volume, back ground noise, conversation in a group reduced its effectiveness. In order have maximum efficiency level it must be used with care. ENT NEWS (P-20-21) vol.8 no. 3 jul / agu 1999

6 Professor Stuart Gate House (2000) MRC Institute of hearing research Glasgow in his report fitting modernizing hearing aids services" pointed out that successful fitting of hearing aids depends as much on the audiologist and their rehabilitation try efforts as the instrument it self. Timeless uses in hearing protectors guide, Smooren Burge (1997) pointed out use of hearing protectors along with hearing aids, he pointed out that their hearing protectors are important in improving hearing by.

1 active noise reduction

2 speech intelligibility

3 accurate measurement

These hearing protection devices may include.

Ear plug

Binaural use of hearing aid

Ear moulds

Adjusting background noise.

ENT NEWS vol. 11 no. 1 mar / apr 2002

7 Why hearing aid are not up to the mark in use as compare to glasses as glasses are acceptable but hearing aids are disadvantageous due to cosmetic reasons. Peoples usually preferred.

1 Small hearing aids

2 In the ear hearing aid

3 In the canal hearing aid

4 Behind the ear hearing aid

Research on cosmetic surgery emphasized human attitude towards disguising use of hearing aids e.g. Noist Trenite (1997) in this issue "facial plastic surgery and European ENT surgeon" emphasized the need of facial plastic surgery conducted by ENT specialist also called Rhino plastic surgery "The patient usually demands that things like hearing aid or glasses should not appear behind ear. Thus in ear hearing aids and contact lenses are preferred. ENT NEWS (P-17) vol. 6 no. 4 sep / oct 1997

8 Stephen Fairfield (1997) pointed out increase demand of hearing aid specially "digital hearing aid in hearing impaired population specially in Europe despite of its "expressiveness digital hearing system" A dispenses view" pointed out important steps in dispensing digital hearing aids 10 new comer.

Touch basic concept

Below of high frequency gain

Allow a lot more time with your clients.

Typing to keep things simple, so on…..

(P-21-23) ENT NEWS vol 6 no. 4 sep / oct 1997

9 Katarina Sherbourne (1997) "specialist rehabilitation for Deafened adults may include many services as profound deafness is a trauma to every one i.e.

Link center for deafened peoples

Emotional and physical problem

Psychosocial support

hearing aid dispensing Cochlear implants

Resources

Efficacy stay

Referral scale

All rehabilitation services are available for deaf children.

(P-21-23)ENT NEWS vol 6 no. 3 jul /aug 1997

To sum up one could say that dispensing of hearing aids its role in rehabilitation of hearing impairment is important and researchable. Most previous researches showed that

Use of hearing aid improve hearing & speech

It is primary device to fight against deafness.

It is a Tool of rehabilitation

It is matter of time to get use to with hearing aids.

Peoples preferred to use hearing aids even though.

They are expensive

Has cosmetic reasons

It may blunt the appearance of a person.

2.2 DEFINITION & INTRODUCTION OF CONCEPT INVOLVED

Various author 1995 “sound and hearing” & Maryanne Tate 1995

“principle of hearing aids audiology” (P-201-227)

1. The hearing
2. The hearing impaired
3. The role of audiometry
4. The hearing aid and
5. Rehabilitation
6. Hearing aid maintenance and usage

Hearing

Hearing has been called the most important of the human senses. It functions day and night, even when we sleep. The hearing organ is responsible for the sense of hearing. The main function of the hearing is to transform acoustic sound waves into neural codes which can be interpreted by the brain.

Anatomy

The organ consists of 3 main sections, the outer ear, the middle ear, and the inner ear.

The outer ear

The outer ear includes the external cartilaginous part of the ear (the auricle or pinna) and the ear canal (meatus acusticus). The outer portion of the ear canal is relatively is soft, while the inner part is hard and bony. The ear canal usually has one or two bends. The cross section is generally oval and its area typically 1 cm^2. The ear canal is closed at one end by the eardrum (tympanic membrane). The wall of the ear canal contains glands which secrete ear wax (cerumen).

The middle ear

The middle ear is normally filled with air. Neutral air pressure in the middle ear is maintained by the Eustachian tube, which connects the middle to the throat (pharynx). In the middle ear cavity there are three small bones called the ossicles; these are the hammer (malleus), the anivel (incus) and the stirrup (stapes). This chain of bones forms a level mechanism which conducts the vibrations of the air in the ear canal to the fluids of the inner ear. Two small muscles, the stapedius and the tensor tympani, are attached to the bones. These muscles are activated by a reflex when loud sounds reach the ear. When activated, they will impede the transmission through the middle ear bones and thereby protect the inner ear. The activity of the middle ear muscles is controlled by the acoustic reflex and can be monitored by impedance audiomerty.

The inner ear

The inner ear (cochlea) is shaped like a snail shell with two and a half turns. It is connected to the organ of balance which contain the semi-circular canals. In the lower turn, two windows are located. They are called the oval and the round windows. The oval window contains the footplate of the stirrup, which acts like a piston moving the fluids of the inner ear. All the way from bottom to the top of the cochlea is the basilar membrane

(approx. 30mm long) on which the hair cells are located. The hair cells are central part of the hearing organ called “the organ of corti” after the Italian anatomist A. Corti. Along the basilar membrane there are rows of hair cells, one row with inner and three rows with outer hair cells.

The inner hair cells

The inner hair cells are the main sensory cells and most of the auditory never fibers to and from the brain innervate the inner hair cells. When a sound is perceived, the basilar membrane will vibrate. The vibration will not have the same intensity at all places along the basilar membrane. Thus, if the sound is high frequency sound (e.g. 10 kHz) the vibration will mainly take place near the entrance to the cochlea, i.e. close to the oval window, where the footplate of the stirrup is located. For medium high frequency, around (1 kHz) the centre of vibrations will move to the middle turn, and for low frequency (100 Hz), the most intense vibration will take place near the top of the cochlea. In this way, different frequencies give rise to vibration at different places along the basilar membrane. Nerve impulses produced by the sensory cells are synchronized with the sound stimulus. If it is a low frequency sound, we can observe spikes in the nerve cells in synchrony with the period of the sound. When the frequency is above approximately 500 Hz, the individual nerve cells cannot react to each cycle, but the nerve bundle as a whole can follow even very high frequencies in synchrony. This observation allows the frequency to be determined by the time intervals between the nerve pulses.

The outer hair cells

The outer hair cells act like a servo mechanism in a car, in the sense that slight vibrations of weak sounds are mechanically amplified. Whereby the inner hair cells are

stimulated. The outer hair cells contain muscle tissue and allow the basilar membrane to vibrate sufficiently even when a low level sound is applied. The function of the outer hair cells is non-linear. This means that they have a significant effect at low sound levels, but practically no effect at more intense levels. This non-linear function of the outer hair cells is easily damaged by noise, such as gun shots and heavy industrial noise. On the other hand, the non-linear function of the outer hair cells creates small amount of distortion which can be utilized to verify that the outer hair cells are functioning correctly.

The nerve fibers innervating the outer hair cells are of the efferent type which transmits signals from the brain to the hair cell. This is consistent with its function as a servo mechanism,. Generally, the action of hair cells and of other nerve cells is intimately connected with some electrochemical processes. This activity can be monitored far from the active cells since the tissue is an electrical conductor. This is widely used for monitoring the function of different parts of the hearing organ. This form of audiometry is called Electrical Response Audiometry (ERA). Different type of ERA exist, the most common ones are called cochleography and brainstem audiometry. Whit these techniques, the electrical activity in the auditory nerve can be registered. The mechanical activity of the outer hair cells creates sound similar to the one stimulating the ear. This can be cochlear echo (or oto-acoustic emission) discovered by the English Physiologist D. T. Kemp.

Nerve Connections

A large number of nerve fibers are connected to hair cells. Some of these transmit signals from the hair cells to the brain. These are called afferent nerves and they are typically attached to the inner hair cells.

The efferent nerves transmit control signals from the brain to nerve cells closer to the hair.

The nerves from each ear enter the brainstem. From there they enter the brain on the opposite side of the head and terminate on the surface of the brain just above the opposite ear behind the temporal bone. This is where the main brain center for hearing is located – the auditory cortex.

The function of hearing

The daily sound environment comprises a variety of sound samples. We listen to the soft sounds from birds singing and the movement of the tree leaves as the wind blows gently through them. On the other hand, we are also exposed to loud sounds like industrial noise, shouting or load music.

The perception of loudness

A normal hearing organ can easily cope with large differences in sound pressure. The weakest sound which can be perceived by a human being depends on its frequency. Hearing is most sensitive at frequencies between 1000 and 4000 Hz. In this frequency area we can hear tones with a sound pressure level close to 20 micro Pascals (µPa) this level is therefore used internationally as the 'zero-point' when measuring the level of sound. At lower and higher frequencies, hearing is less sensitive. The normal hearing threshold is used as a bench-mark for hearing ability. If a person can perceive weak sounds corresponding to the normal hearing threshold, he has normal hearing. If he needs amplification of about 40 dB to detect sound, he has a hearing loss of 40dB HL. HL means hearing Level as it is referenced to the normal hearing threshold.

2.3 HEARING IMPAIRMENT

A person is by definition “hearing impaired” when he or she is unable to manage hearing tasks as well as young people with normal hearing. The most common sign of a hearing impairment is that of having problems hearing quiet sounds. Most hearing impaired people have few problems detecting sounds with a significant low frequency components, such as speech or music, while severe problems are experienced when the sounds contain high frequencies only, such as birds signing or the sound of the glasshopper. Some hearing impairment can be easily remedied by a doctor. Some can be alleviated with a hearing aid, but for some types nothing can be done. It is therefore important that an ENT doctor and audiologist examine the hearing impairment and make a diagnosis, which determines whether a hearing aid may help or whether other measures should be taken.

A hearing impairment may result from abnormalities any-where in the auditory system. If located in the ear canal or in the middle ear, it is called a conductive loss. It is called a sensorineural loss if it is due to problem in the sensory cells in cochlea or in fibers of the auditory pathways. Very often, conductive losses can be remedied by the ENT doctor or they may even cure spontaneously.

2.3.1 Conductive Hearing Impairment

The glands in the ear canal produce ear wax (cerumen) all the time. Some time wax accumulates in the ear canal and may even block it totally. This is especially common when a hearing aid is used, since it has a tendency to compress the wax in the ear canal because the normal (physiological) cleaning process is obstructed. Such a wax plug may attenuate sounds substantially and be of great annoyance. Since there is risk of

damaging the ear drum – or even the inner ear – when removing ear wax, it should not be removed by an unskilled person, but rather by an ENT doctor.

2.4 AUDIOMETRY

Audiometry is the general term applied to a number of tests used to measure hearing. Here briefly describe some audiometric tests which are directly related to the fitting of hearing aids. Inevitably, discussion regarding hearing tests will not be very detailed or extensive. For further information we refer to the relevant standard listed in section 4.2. Especially, the standard "ISO 8253-1 acoustics – audiometric test methods – part 1" is recommended.

2.4.1 The audiometer

An audiometer is an essential instrument for conducting most audiometric tests. The audiometer is basically a device that generates pure tones of known level and frequency, and delivers these to the patient through either a headphone or a bone conduction vibrator.

On an audiometer, the level are given as Hearing Level, dB (HL) in this way, a normal hearing person will be able to hear tones at and above a 0 dB HL level.

Since these levels are average levels measuring in a standard coupler, the actual sound level at the patient's eardrum can differ considerably. One might expect up to as much as 15 dB individual deviation from the average.

Instead of using headphone one can be use insert earphones, where the transducer, by means of an earplug, is inserted into the ear canal. Insert earphones offer some advantages regarding reduction of possible masking effects from environmental noise during audiometory. Also in the case of non-symmetrical hearing loss, insert earphone

are preferable, as their coupling to the opposite ear is minimal. Finally, insert earphones can be used in cases where the ear canal; collapses when using conventional earphones.

When recording the air conduction threshold, the sound must pass through the ear canal and the middle ear to reach the hair cells in the inner ear. When the bone conduction threshold is recorded, a bone conductor is used. The signal then by-passes the ear canal and middle ear and is conducted directly through the bones of the cranium to the inner ear. Therefore, if the air conduction threshold is worse than the bone conduction threshold (an air-bone gap), the reason must be found in the ear canal or in the middle ear.

2.4.2 Audiometric tests

An audiogram contains information about the hearing loss at a number of frequencies. The total hearing loss, as measured with headphones at any frequency, is called the air conduction hearing threshold level. The sensory part of the hearing loss, as measured with a bone conductor, is called the bone conduction level, or bone conduction threshold. Note that not all audiometers have bone conductor facility.

Audiometric test may be less formal with small children. This type is called play audiometry, and employs sound from daily life (e.g. teaspoon against cup, toy sounds, whispers).

A special test category, which does not demand active participation by the patient, is called objective testing. It includes brainstrem audiometry, Cochleography, and the measurement of otoacoustic emission.

2.4.3 Audiogram

The audiogram is a graphic representation of the audiometric results.

2.5 THE HEARING AID

The basic function of a hearing aid is to amplify sound in such a way that it is made audible to the hearing aid user. Although many types of hearing aids are available they all share a number of common features. Here are some detail at the various hearing aid types, their components and electroacoustic characteristics.

2.6 HEARING AID MODELS

Hearing aids are divided into four main groups:

1. Behind The Ear (BTE)
2. In The Ear (ITE)
3. Body worn aid
4. Hearing glasses

2.6.1 Behind the ear (BTE)

The BTE hearing aid is widely used model. It is placed behind the ear, and the sound is conducted to the ear canal through a plastic tube and an earmould. BTEs can be used for the majority of hearing losses. They are the typical choice for severe losses due to their gain and output capabilities and the possibilities of combining them with educational equipment via audio input.

2.6.2 In the ear (ITE)

The ITE hearing aid is placed directly in the cavity of the outer ear. All parts of the hearing aid are built into the earmould. One advantage of ITE hearing aid is that the "natural" effect of the outer ear (pinna) is maintained, making it easier to determine the direction of the sound source and take advantage of the natural high frequency amplification of the pinna.

ITEs can be modular or custom made. In the modular type, the hering aid is a complete functioning unit so small that it can be placed entirely within or onto an earmould. This makes it easy to place and repair the hearing aid. Custom made models can be made slightly smaller in size, but at expense of ease of replacement and repair. Both types are available in two basic models: Full concha and canal.

2.6.3 Full Concha Model

The full concha model will occupy most of the concha of the outer ear. It can provide more amplification and output than the canal model. A variation of this model is called a “semi” or “half” concha. In the helix part, or most of it, is removed.

2.6.4 Canal model

Canal aids, especially in their CIC format (completely in the canal) are the smallest type of hearing aid available. Because of its small size, only miniature batteries and receivers are used, causing limitations in amplification, output and battery life. The receiver and microphone are placed so close to one another that the risk of feedback is higher than in other models. Therefore, canal aids are used mainly for mild-to-moderate hearing losses.

2.6.5 Wax guard

Many ITE instruments are supplied with a wax guard to prevent cerumen from blocking the sound channel or from damaging the receiver. Most wax guards can be replaced by the user or the hearing aid specialist.

2.6.6 Body worn aid

In most instances, body worn aids are used for those having severe to profound hearing losses. In some cases, they are used when the user has difficulty in handling other

types of hearing aids. Such may be the case for very young or very old hearing impaired person.

A body worn aid can provide more amplification than other hearing aid types because the receiver is separated from the hearing aid by a cord. This reduces the risk of feedback, permitting more power to be utilized. The receiver is snapped onto the earmould. The body worn aid is worn in a pocket or can be hidden by clothing. Very young children often use a microphone cover to prevent food from damaging the microphone.

2.6.7 Hearing glasses

In hearing glasses the amplifier, microphone and receiver are built into the side arms. This was for many years a popular way of camouflaging a hearing aid and some users found hearing glasses easier to manipulate than BTEs. However, the practical drawbacks of combining visual and hearing rehabilitation into one device have become so evident that hearing glasses are now slowly disappearing from the market.

A variation of hearing glasses is the use of adapters which connect a BTE hearing aid to the side arms of spectacles.

2.6.8 Inside a hearing aid

Although a modern hearing aid is very small, it contains a large number of electronic components. Here are the main properties of these components.

The main components of a hearing aid are:

1. An input transducer, a) microphone or b) telecoil
2. An amplifier with volume control, filters, automatic gain control (AGC) and max. out put regulation.

3. A receiver (loudspeaker)
4. A battery

The input transducer

2.6.9 The microphone

The microphone converts sound waves into electrical signals. The electret microphone is the most commonly used type. It is a special type of condenser microphone with a built-in low-noise preamplifier. The electret microphone has a smooth frequency response and a low sensitivity to mechanical vibrations. This reduces the risk of acoustic feedback.

Hearing aid microphones exist in a number of versions having different frequency responses and sensitivities. Some hearing aid types are available with optional microphones. The most commonly used microphones are: normal range, wide range, 6 or 12 dB per octave ski slope, step response and damped peak microphones.

As a alternative to shaping the frequency response with special microphones, electric filteric techniques have become more common. These techniques may be preferable with regard to reducing internal noise from the microphone.

Microphones can be omni directional or directional. Most microphones used in hearing aids are omni directional, meaning that sound is received from all directions with almost equal sensitivity.

To improve speech discrimination in noise, a directional microphone can be used in BTE hearing aids with the effect that signals coming from behind are being suppressed, thus improving the user's ability to attend to the frontal sound source.
In reverberant situations, the positive effect of directional microphone is diminished.

2.6.10 The amplifier

Signals from the microphone or the telecoil are fed to the amplifier. This weak low-energy signal is transformed into a powerful electrical signal which drives the hearing aid receiver. There are different types of amplifiers. The class A amplifier uses the same high amount of current whether there is a signal at the microphone or not. It has now been almost completely replaced by amplifiers with lower current consumption.

The linear push-pull amplifier (Class B), and modern variation of it, are far more economical and have very little distortion. Power consumption is low whenever the signal is weak, and higher when a stronger signal is present at the microphone.

Switching amplifier utilize pulse modulation to increase the useful effect of the amplifier. The amplifier may be partly integrated into the receiver. Switching amplifier is characterized by low distortion and high efficiency. One type of switching amplifier is called Class D.

Amplifiers can be made with discrete components mounted onto a printed circuit board, as thin film or thick film circuit blocks, as integrated circuit (IC), or as a combination of these.

2.6.11 The receiver (Loudspeaker)

The receiver converts the amplified electrical signal into sound waves. These are different receiver types, both in size and performance. Generally, size determines the sensitivity and the maximum output of the receiver. By using an acoustic filter, the frequency response and the frequency range may be improved.

2.6.12 Batteries

Different size and types of batteries are available. Zinc air batteries are by far the most commonly used type. Zinc air batteries have high energy density, they are affordable, and used batteries have little impact on the environment.

Batteries capacity is measured in milli-ampere hours (mAh). For instance, if a battery having a 100 mAh capacity is used in a hearing aid with a battery drain of 1 mA, it will last approximately 100 hours. Battery drain for modern zinc air batteries are very competitive, coming close to the performance of mercury and silver oxide batteries.

Alkaline batteries are used for body worn instruments and hearing aid remote controls.

2.6.13 Adjusting the hearing aid

Sound delivered from a hearing aid can be controlled by adjusting the hearing aid. A substantial part of this adjustment is performed by the hearing healthcare professional when fitting the hearing aid. Adjustment made by the hearing healthcare professional cannot, in general;, be changed by the user. Some adjustments, however, may be at the user's discretion.

2.6.14 User operated

The volume control (VC)

Most hearing aids have a volume control, which enables the user to adjust the amplification of the hearing aid according to the different listening environments. Some hearing aids have no VC accessible to the user. Instead they are equipped with some sort of automatic gain control and the gain is pre-set by the manufacturer or the hearing healthcare professional.

The on/off switch

The hearing aid is turned on or off by using the on/off switch. This can either be a tiny switch, mounted on the hearing aid case, or it can be integrated into the battery compartment for ease of operation.

The M-T switch

Many hearing aid models are provided with a switch, enabling the user to choose between receiving the signal, either from the microphone, or a telecoil loop system. This is called the M-T switch. The hearing aid receives the signal from the telemegnatic loop system whenever the M-T switch is in the T position. The telecoil system is often used in theatres, cinemas and churches. With a well adjusted telemegnatic system, the use of the telecoil, instead of the normal microphone input, may improve sound quality significantly in situations where backdround noise is present and there is a relatively large distance to the sound source.

When the hearing aid is in T mode, the microphone is disabled. In some situations, it may be advantageous to use T and M simultaneously, e.g. when listening to the TV via the telecoil, while still wanting to hear speech, the door bell or other important environmental sounds. For this purpose, some hearing aids have an MT mode which activates both the microphone and the telecoil simultaneously.

The N/H switch

Some hearing aids have a normal response high tone switch (N-H switch), often instead of the M-T switch. When placed in the H position, the N-H switch will change the sound from normal response to high tone emphasis by attenuating the low frequencies. This improves speech discrimination in noisy environments, e.g. traffic, subway, in a car.

Program selection switch

Some multi-program hearing aids have a program selection switch on the hearing aid.

Remote control

Many hearing aid users prefer to control their hearing aids in a more sophisticated manner. They want to select from a larger number of features, depending on the listening situation. Since the hearing aid user often wants a rather small and cosmetically acceptable hearing aid, such controls cannot be implemented in traditional ways with switches and trimmers.

Instead, it is possible to provide hearing aid models with several user selected programs. Such a program contains a combination of acoustic parameter settings, matched to provide optimum listening for a particular user in a certain listening situation. By using a remote control, the user can select from a number of pre-set programs. The transmission pathway from the remote control to the hearing aid is either based on infrared light, ultrasonic sound, or radio waves. By the simple press of a key on the remote control unit, the hearing aid user has immediate access to the best acoustic response for a given listening environment.

2.7 REHABILITATION

2.7.1 The rehabilitation process

The most common cause of acquired hearing loss in adulthood is the result of the ageing process (presbyacusis). About 8 % of the adult population have a hearing loss over 35 dB in the better ear (Haggard, Gatehouse and Davies 1981), while approximately one-third of the population over 65 yesrs old has some sort of hearing problem, and approximately half of the population over 80 years old has a severe hearing problem.

Hearing losses of this type develop gradually over a period of years, with high frequency sounds reducing first. This means that speech can still be heard, but it loses its clarity. A binaural hearing loss of as little as 15 dBHL, averaged across the frequencies 500 Hz to 2KHz, is likely to be significantly disabling for everyday speech (Lutman, Brown and Coles, 1987). An effected individual typically accuses others of mumbling or speaking quietly, and this leads to increased tensions within the family. Although hearing loss may be suspected, this is not usually a suggestion that is readily accepted by the hearing impaired person, who often preferred to cope with the restriction of personal and social life rather than admit to deafness. In many cases there may be a gap of as much as 15 years or more between noticing the problem and taking any action to deal with it.

Hearing loss is a underestimated impairment that may lead to many secondary problem in addition to primary communication difficulties. Management of the hearing impaired client is extremely difficult and, unless the client accepts the problem, rejection of any form of hearing aid is very likely. Even when the need for amplification is understood, deafness remains an unacceptable condition and most people would prefer to use an inconspicuous hearing aid. Indeed, although commercial aids provide a wide choice of size, type and frequency response, most of those people who choose to use private hearing aids do so for cosmetic reasons (Rendell et at., 1992).

High expectations of the benefit to be derived from hearing aids add to the difficulties, especially as most adult do not realize hearing loss is not ‘cured’ by amplification. Hearing aids alone are not sufficient to overcome the consequences of the loss. Audiological rehabilitation involving a co-coordinated program of evaluation and remedy is therefore appropriate.

Aural rehablitaion begins with an evaluation of the hearing loss and its effect on the client's life-style. At this stage it is decided if remediation is necessary and, if it is, whether hearing aid should be considered. In some cases assistive devices may be sufficient to fulfill the client's needs. If hearing aids are to be considered , and following referral to a medical practitioner if indicated, the acoustical characteristics can be defined, together with any special rehabilitation measures required. It is usually helpful to include to a member or members of the client's family in the process, as not only can they support the hearing impaired person far better if they understand, but also concerns are more likely to be aired at an early an area on its own but is interwoven into hearing aid fitting and evaluation. The success of the whole process is reliant on the sum of the individual parts. An error in any part may adversely affect the whole, for example, incorrect uncomfortable loudness levels (ULLs) could lead to the fitting to the hearing aid that is too loud. The aid might appear suitable in the quiet of the fitting situation, but in the noise of the outside world prove unbearable. The client could turn it down but then would not hear adequately, leading to rejection of the aid. Another example could be where the hearing aid audiologist fails to consider the patient's dexterity, leading to the selection of an aid that the client is unable to insert or operate.

The aid type suggested must be acceptable to the client such that he or she is both able willing to wear it and, if it is a commercial aid, it must be affordable. These and many other factors interact in the audiological rehabilitation process. The client attitude towards hearing impairment and amplification is crucial to the rehabilitative process, and four attitude tyoe have been outlined (Goldstein and Stevens, 1981)

Type I - the patient has a very positive attitude towards hearing aids and aural rehabilitation.

Type II - is an essentially positive attitude but with some complicating factors present. These might, for example, include a previously unfavorable hearing aid fitting experience, or a difficult-to-fit hearing loss.

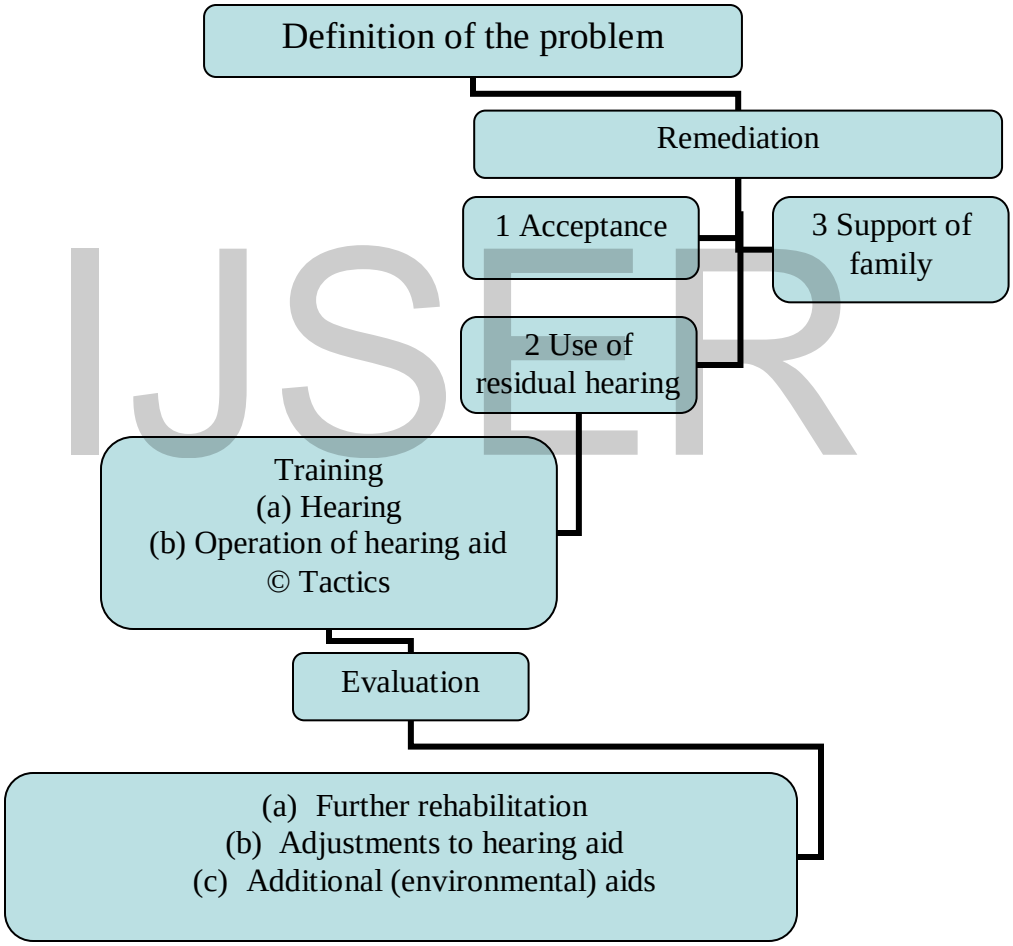
Type III - is an essentially negative attitude but with an element of co-operative intent.

Type IV - consists of a small group who reject hearing aids completely. Unfortunately, rehabilitation is rarely successful with this group.

A simple problem-solving model of the rehabilitation process is presented in following Fig. The process begins with a definition of the problem. At this stage the hearing aid audiologist collects information regarding the client's hearing loss, his or her areas of difficulty, his or her attitude and related aspects. Informal discussion, a case history and audio logical assessment are the most widely used tools for defining the problem. Handicap questionnaires and speech audiometry may add further depth to the investigations.

The focus of any rehabilitation process should be on the needs of the individual, and aural rehabilitation can be defined as helping an individual with a specific set of problems arising from and auditory disorder. Rehabilitation can therefore be considered as a process that is designed to minimize disability due to hearing loss or tinnitus (and to some extent, balance) in order to prevent the condition from handicapping the client.

The hearing problem can be viewed as a continuum in which disability and handicap represent different stage. Initially, damage to the auditory system leads to impairment or hearing loss. This creates a disability, but it is the degree to which this disability affects a person's quality of life and well-being that imposes the handicap.



Thus, for example, a moderate hearing loss might have only a slight handicapping effect on an elderly client living alone, seeing few visitors and whose only real problem seem to be hearing the television. An identical, degree of hearing loss in a young married man could cause a considerable handicap. The disability of hearing impairment is likely to affect every aspect of his life-style and employment because of its impact on communication. Activities that were previously enjoyable become difficult and he is likely to experience embarrassment, irritation, frustration, anger and depression. He will almost certainly perceive a change in his status, at least in his own eyes, and will suffer a loss of self-esteem.

The need to wear a hearing aid is generally regarded as related to the ageing process and society makes few allowances for hearing impairment. Unlike wearing spectacles, where the individual may be considered intelligent and studious, hearing aid carry a stigma. They are an external sign of deafness, which may view as being accompanied by stupidity because of the communication problem it creates. Spectacles may result in perfect vision. A hearing aid rarely produces an immediate return to normal, but is much in parallel with the use of a wheelchair. Socially, hearing loss produces less sympathy and understanding than the loss of limb.

Hearing loss is rarely total, and the person who hears some things and not others is described as awkward, he hears when he wants to'. In background noise and group situation, following conversation may be impossible. The hearing impaired person wants to maintain social interaction but restricted involvement in conversations has to be tolerated. Some attempt may be made at finding a way of controlling the social scene or

avoiding it (Hallberg and Carlsson, 19991). Often, particularly in the early stages, the hearing impaired person will prefer to isolate himself socially.

The objectives of the first stage in the rehabilitation process, then, are to assess the impairment through audiometry, and the nature of the handicap through investigation of the client's home, work and socials environment, the activities in which he or she wishes or needs to participate and the difficulties being experienced. Only when the problem has been defined can a realistic approach to remediation be adopted.

The remediation process involves more than just hearing aid fitting. It involves setting the scene to facilitate the best possible use of amplification. There are some individuals for whom hearing aids may not be appropriate, and sometimes assistive devices, such as a television amplifier, may provide a successful answer to a specific need. Where hearing aids are appropriate, counseling is often required to help the person come to term with his or her loss and accept realistically the impairment and ensuring handicap. If the client maintains a type III attitude, with perhaps only a grudging acceptance of a problem, much counseling may be needed to achieve acceptance. Even where clients maintain positive, type I, attitude, counseling is equally required to help them understanding the potential benefits and limitations of amplification. The client needs to understandings that hearing aids will not provide perfect hearing and, while they can be of great benefit, it will take time to relearn to associate sounds with meanings. A positive attitude is undoubtly helpful but unrealistic expectations will lead to disappointment and the possible rejection of any amplification system. Most adult are interested to know about their hearing loss and to understand the difficulties they experience.

If the hearing loss is of sudden onset the impact is much greater than a loss that has developed slowly and insidiously over many years. The patient has not had time to compensate for the loss or to come to terms with it. The hearing impaired person (or the parents of the hearing impaired child) need time and empathetic counseling to move through stages of grief and mourning at their loss they are ready to understand or accept. Such stages can be identified as follow.

Stage I – *numbness*

It is usually the ENT surgeon or otolaryngologist that is involved at this point to provide direct advice on handling the impairment. Unfortunately, the client is often unable to absorb much of the information given at this stage.

The client refuses to accept the diagnosis and searches for a second opinion or a miracle cure. The client is not yet ready for amplification and if hearing aids are prescribed they are unlikely to be used. 'Initial strategies involve denying disability will be exposed. The deafened person looks medicine for a cure to problem which is seen as stemming from faults in the ear. When the cure is not forthcoming, the deafened person experiences a further loss – that of hope.' (Woolley 1991).

Stage III – *despair*

This is the stage at which the hearing loss is accepted but the problems often appear insurmountable. Positive but realistic counseling of the client and his or her family can help the client to move towards acceptance of the problem and a desire to try to overcome them.

Stage IV – *action*

The client is ready to accept amplification. Counseling and training now interlink to facilitate the client's adjustment to the impairment and to the use of amplification.

Whatever the degree of loss and the pattern of its onset, involvement of the family or a 'significant other' is important as their help and support can be of immense value. A 'significant other' is anyone who is in close and frequent contact with the client and will often be the spouse or a son or daughter. Their presence throughout the rehabilitation process, at the assessment, hearing aid fitting and aftercare, can help them to understand the nature of the problem. Their expectations also have to be realistic and they need to realize that it takes time and effort to overcome the handicap of of deafness. They also are affected by the loss they need to understand the problems of poor speech discrimination, difficulty in noise, recruitment and so on if they are to be able to provide realistic support and encouragement to the hearing impairment person. They can also ensure that practical instructions have been understood and, if necessary, can help in inserting the aid and in its care.

2.7.2 Practical aspects of rehabilitation

Practical instruction

a. First time hearing aid users will require training in effective hearing aid use, which can be considered as 'informational' counselling'. Such counselling is also required to a lesser extent when a client changes from one hearing aid system to another or from monaural use to binaural.

b. Difficulty in inserting the earmould or hearing aid is the most common reason for lack of use. It is an activity that has to be learned through practice, and it is essential to ensure that the client or his or her carer is able to insert and remove the aid at the hearing aid fitting stage, while the hearing aid audiologist is on hand to provide guidance. It is a common fault for clients to be shown how the aid should appear when properly inserted. Where there is some difficulty in manual ability half shell moulds may provide a useful option as these are easier to insert and a small handle can be fitted to help in removal. Very small hearing aids with very small controls and tiny batteries are only appropriate if the client can how much the client wants a small aid.

Operating the aid

New users need precise simple instruction on operating and care of the hearing aid. They must be sure of the size and type of battery to use. If they are using zinc air batteries they need to be aware that removal of the tab will cause the battery to deterioate. It is common for a user to try several new batteries, one after the other, if the hearing aid does not work. The use of a battery cell tester to ensure the adequancy of the battery current can avoid this problem since the client can then be certain whether it is battery at

fault. Insertion of the battery can be difficult with poor eyesight or failing dexterity. It is sensible to change batteries over a towel (on the table or on the knees) as it is much easier to retrieve a small battery in this way. The client needs to realize that the battery has a positive flat side, and negative rounded side. The battery must be in the drawer the correct way around, with the positive side matching the positive sign shown on the aid.

2.8 HEARING AID MAINTENANCE AND USAGE

2.8.1 Maintaining the hearing aid

In general, little maintenance is necessary with a high quality hearing aid. If the hearing aid malfunctions, the defect is often a simple thing which can be alleviated without sending in the hearing aid for repair.

A few culprits which tend to cause defects are mentioned below.

2.8.2 Batteries

Today, zinc-air batteries are normally used. These only work when supplied with air (oxygen). The user activates the oxygen supply, when removing the self-adhesive label that covers the air holes in the battery. When the label removed, there is a risk that a small portion of sealing material sticks to the surface of the battery. This could be deposited on the battery contacts with the effect that the instrument does not function correctly. This can be avoided by wiping off the battery with a napkin or a dry cloth before inserting it.

Occasionally, batteries are partially exhausted shortly after they have inserted. This indicates that the batteries from “breathing”.

Batteries can be harmful to the environment. Therefore, used batteries should be return to the supplier, who ensures that they are properly disposed of.

Batteries should be kept out of the reach of children, who may put them in their mouths and swallow them. In case of ingestion, a doctor should be contacted immediately.

2.8.3 Earmould

Moisture will inevitably enter that sound channel of the earmould as well as the tube connecting the earmould to the hearing aid. The moisture can form a droplet and block the sound channel.

The moisture is removed by disconnecting the tube and earmould from the hearing aid and by blowing dry air through the sound channel with a syringe or air blower.

2.8.4 Cerumen or earwax

Earwax, or cerumen, in smaller or large quantities can block the sound outlet. As is the case with moisture, this will result in the hearing aid sounding weak or having low quality sound. Even small quantities of wax, although not blocking the sound channel totally, may result in a change of the acoustic quality of the hearing aid.

2.8.5 Feedback

Whistling, or acoustic feedback, is caused by a leak in the sound system. In BTE aids can often be due to the tubing, and a new tube may solve the problem.

Feedback or whistling may also occur when eating or otherwise moving the jaw. This may be taken as an indication that the user needs a new earmould.

2.9 UNDERSTANDING THE HEARING PROBLEM

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Prospective purchasers of hearing aids may approach their initial amplification experiences showing astounding naivete regarding hearing, hearing loss and hearing aid use. Adults with acquired loss or parents of hearing-impaired children may know little

about the advantages and limitations of amplification. They may not understand the principles of effective hearing aid use. Examples are numerous.

One woman was convinced that her hearing aid battery was powered by solar energy, and that in Arizona's sunny climate it would never need replacing. Parents of a child with a newly discovered loss were eager to procure aids immediately to implement regenerative exercises for the auditory nerve. An elderly patient was unaware that the binaural aids in her eyeglasses consisted of tow separately adjustable units.

Hearing aid users must understand what aids are for and how to use them. Without advice, new hearing aid owners are likely to first try them out in places where they have the most difficulty, not the least. They want to learn how much they benefit in noisy and difficult circumstances where they really need help. They may be discouraged by the amplified noise and resultant poor function.

Adults with hearing loss must learn why they can hear sounds but not always understand them. It may, in fact, be necessary to convince them of the very presence and organic nature of their hearing disorder if they have been overreacting and blaming their problems on mental incapacity. On the other hand, they may have attributed their difficulty in understanding to the mumbling speech of others.

Parents must accept and learn to deal effectively with their child's hearing loss. During the process, they may experience a sequence of emotional reactions. Denial may be their understandable first reaction when told their young child is hearing impaired. If so, the parents must be convinced. An independent second opinion may be helpful in verifying the loss and convincing the parents. In the initial counseling session, little more than communicating the fact of the loss may be possible. Even if the parents have

strongly suspected a loss previously, they are now being asked to accept and acknowledge it as certain. The emotional impact of this information may preclude absorbing any additional information.

A similar situation may occur during the initial counseling of adults seeking help may deny or minimize the hearing problem when the audiologist verifies it. In these cases the magnitude of the loss must be explained and its effects demonstrated.

The audiologist must clarify for the patient, or the parents of the hearing-impaired child, the nature and extent of the hearing loss. The explanation must be undertaken using terms familiar to the patient. Overwhelming technical jargon must be avoided. For example, to the patient, Hertz is a commercial firm whose name is apparently being mispronounced. Audiologists should speak simply, use redundancy and get feedback. However, they should not talk down to the patient. Because patients are uninformed about hearing does not mean they cannot learn.

Acceptance of the presence of the hearing loss is often followed by a natural desire to treat and correct the disorder. If not already done, competent medical examination must be obtained with a clear explanation of the treatment alternatives. It is essential that the irreversibility of the sensory-neural loss be accepted. If not, time which might be important for rehabilitation will be lost, as a cure is continuously sought. Additionally, unscrupulous practitioners may victimize the patient with ineffective treatment.

The various types of (re)habilitation should be described. This information is particularly pertinent to the parents of the child with newly discovered hearing loss. They will probably know nothing of the effect of congenital hearing loss on language and

speech development, or the educational implications of deafness. They must be helped to understand and accept these implications. If the loss is severe, they may need to make a studied decision about the language system the child will use. They deserve an objective presentation of the pros and cons on which to base their decision.

All of these things are prerequisite to counseling about the nature and use of hearing aids. Unless the patient and family understand the problem, it is unlikely that the counseling will have the desired effect.

2.10 UNDERSTANDING THE NATURE, ADVANTAGES AND LIMITATIONS OF HEARING AIDS

Realistic expectations are crucial to successful hearing aid use. Before hearing aid use is undertaken, it should be understood that a hearing aid is similar to a miniature public address system. That is, it functions to make sounds louder not clearer, except for the improved intelligibility associated with the increased loudness. It must be understood that hearing aids do not correct all of the problems associated with hearing loss. The prospective user must realize that a properly fitted hearing aid will make soft sounds comfortably loud and that no sounds will exceed tolerable loudness, and further, that maximum amplification will be delivered for those frequencies where the hearing loss is greatest. Beyond that, the benefits from the aid will be a function of how well the patient's ear can differentiate, or learn to differentiate, sound. The success of this depends on the patient and the ear, and not on the properly functioning hearing aid.

It must be realized that hearing aids function poorest in situations in which the majority of hearing-impaired individuals need them most. Persons with sensory-neural

hearing losses suffer a disproportionate drop of discrimination ability in noise, relative to normal-hearing individuals (Olsen and Tillman, 1968; Ross and Giolas, 1974).

The prospective hearing aid candidate should know whether to wear the aid full time or part time. The answer to this question will be determined by the magnitude of loss, the demands on the patient's hearing and the acoustic circumstances under which listening takes place. Generally, people with slight or mild hearing losses benefit from part time use and wear their aids in quiet surroundings where people talk softly. Those with moderate losses are likely to wear their aids most of the time, but may remove them in "cocktail party" listening situations. Therein, the combined babble of many voices overwhelms their discrimination ability and amplification may only contribute irritation. Listeners with severe or profound losses who use amplification are likely to be full time wearers of hearing aids. In those difficult listening circumstances in which their reduced discrimination does not permit under standing of speech, their aids at least keep them in contact with the environment. Appropriate counseling in this area should prevent problems such as those of the steel-worker with noise-induces loss who once came to the clinic seeking help adjusting to his powerful body-worn hearing aid. He explained, "Doc, I'm determined to get my money's worth from this thing, so I turn her up full, but when those rivet guns get started, H have a helluva time keeping her on."

Misconceptions must be removed. Considering hearing aid use, some think aids may improve or decrease hearing sensitivity. They should be informed that while auditory attentiveness and functional ability should certainly increase with hearing aid use, exercising the ear via amplification will not improve sensitivity. Conversely, there are reports of threshold shift associated with amplification (Jerger and Lewis, 1975;

Darbyshier, 1976; Hawkine, 1982). While these reports are not common, they justify instructing the new hearing aid user to be alert for apparent change in hearing and to obtain regular audiologic evaluations. Routine testing should probably be done yearly for adults and semiannually for children who wear hearing aids. In short, there is no rational for rushing into, or avoiding, initiation of amplification because of concern over change in sensitivity in either direction.

Many adult hypacusics express the concern that the use of a hearing aid will make the wearer dependent on amplification to extent that unaided hearing will subsequently be less effective. They should be assured that such is not the case. Further, it should be explained that if amplification does in fact prove useful enough for the wearer to feel dependent on the hearing aid, there is certainly no good reason to be deprived of the benefit.

Some prospective hearing aid user may have been misinformed that the nerve in their ear is dead or damaged and therefore a hearing aid will not be helpful. They should be told that, while the aid will not restore the damaged sensory mechanism, the great majority of people who were and benefit from hearing aids have sensory neural loss. A similar situation may exist for those with unilateral disorder, precipitous high frequency loss or others not historically considered good hearing aid candidates. They may have been told they cannot benefit from hearing aid use. Innovations described elsewhere in this book may offer successful hearing aid use, and at least a trial should be considered.

In summary, the audiologist should listen to the patient's conceptions and misconceptions, answer questions, explain and reassure. Literature that will help patients

understand hearing aids includes that written by Dodds and Harfourd (1970), Israel (1975) and Corliss (1978).

2.11 LEARNING EFFECTIVE HEARING AID USE

The patient should understand the need to learn proper hearing aid use. There are several facets to learning efficient use of amplification. These include such physical aspects as learning to insert and remove the aid, manipulating the controls, and putting in and removing the battery. Care and maintenance of the aid are also involved. Most importantly, learning to accept the aid and listen effectively are features in hearing aid orientation.

2.11.1 Physical Aspects of Hearing Aid Use

Beginning hearing aid users will have trouble putting the hearing aid on. They should be assured that, with practice, this act will become effortless and automatic. They should be shown how to hood the hearing aid, how to insert the ear-mold into the canal, and how to place the aid over the ear. They should practice before a mirror. Stress should be placed on the importance of seating the ear-mold correctly and completely. Patients should be reminded to turn the aid off before removing it, to avoid feedback. They should be told to remove the aid by grasping the ear-mold, not the aid itself or the tubing.

The audiologist should explain the various controls that patients must learn to use, and show how they operate. Patients should be told where the controls should be set. It is essential to lean manipulation of the gain control quickly and accurately while wearing the aid in order to be able to adjust it in different acoustic environments for optimum amplification. Lack of physical dexterity, such as that caused by arthritis, may prevent

patients from making these adjustments. It may be necessary to recommend an aid that is easier to manipulate such as the body type aid.

Some or all of the following controls are found on hearing aids, and the patient should be taught their purpose and operation.

2.11.2 The Off-On Switch

The off-on switch is variously located. It may be incorporated in the gain control On some aids, it is associated with the telephone switch. /Commonly, behind-the-ear aids are turned off by partly opening the battery compartment.

2.11.3 The Input Selector

An input selector is present on some aids. Usual settings are telecoil, microphone, and sometimes combined telecoil and microphone inputs. The patient must understand the purpose of these settings and their efficient use.

2.11.4 The Gain Control

When the hearing aid is on the ear the gain control wheel of some aids must be rotated upward to increase amplification. On other aids, the control is rotated downward to increase gain. Controls on still other aids are horizontal when the aid is on its use position. The patient must be thought the particular details.

2.11.5 The Tone Control

There may be a tone control which effects some change in frequency response. The preferred setting, or the acoustic circumstances in which the setting should be changed, should be taught the patient.

2.11.6 The Internal Controls

Some hearing aids have preset controls which should not be manipulated by the patient. Instruction about these controls should be duly given.

2.11.7 Care and Maintenance

To keep ear-molds clean and prevent accumulation of wax, they should be washed regularly in warm, soapy water. However, this activity requires that the ear-mold be removed form the hearing aid. Therefore, it may be difficult for some hearing aid users, those with reduced vision, neuromotor problems or advanced age. The audiologist must judge, based on observed ability, whether to recommended that the patient wash the ear-mold. At any rate, it should be made abundantly clear to the patient that only the mold, not the aid itself, should be washed. Further, it should be stressed that it is important to dry the mold carefully before replacing it on the aid to remove all water form the canal. If the decision is made not to instruct the patient in washing the mold, and if another person is not available to perform this function, it may be helpful in preventing wax accumulation to recommend that the mod and aid be wiped carefully with a dry cloth or tissue after each removal.

Causes of feedback should be explained to the patient. The audiologist should mention the effects of poorly fitting ear-molds, occluded sound channels, and loose tubing. The patients should be told that feedback will result form a poorly fitting ear-mold, too much gain or the presence of sound reflecting surfaces close to the aid.

Patients must know the type of battery needed; how to insert the battery properly and be reminded that the aid will not function of the battery is inserted backwards.

Instruction should be given to buy a voltage tester, and patients should be shown how to use it to check batteries. Batteries sh9uld be checked at the end of each day and discarded if thy fall below specified voltage. A new battery should be tried if speech sounds faint or unclear of if it is necessary to rotate the gain control more that usual for adequate loudness. Hearing aid users should not expect to use the battery until it is absolutely dead, since harmonic distortion tends to increase toward the end of battery life (Lotterman et al, 1967). One suggestion is to have the new hearing aid user record for a time the hours obtained form each battery after daily use of the aid has stabilized. The resultant average can serve as an alert to replacement time. Gaeth and Lounsbury (1966) demonstrated that parents are not always aware of this need. In a questionnaire asking how long children's batteries lasted, 9% of the parents indicated that the batteries lasted 12 months or more. Another 14% were apparently more honest, and admitted that they had no idea.

Elements of hearing aid care should be considered. Patients should be told not to subject the aid to excessive heat (radiators or sunlight) or humidity (hair spray or vaporizers). They should be alerted to kinked or occluded tubing and broken cords on body aids, which cause intermittent function.

2.11.8 Effective Listening

Patients must first learn how to set the gain control for best listening. This setting should be made by ear, not by eye. The criterion should be comfortable loudness for existing acoustic conditions. No single gain setting can provide adequate and comfortable amplification for all daily listening conditions. Patients should learn to turn the gain up when it is quiet and down when it is noisy. They should not continuously fiddle with the gain control in an attempt to equalize loudness of each incoming signal. Rather, as they

move from one general acoustic condition to another, they should adjust the gain to compensate for the overall change. The audiologist should determine a gain setting for optimum listening in quiet and assist the patients in learning to make intelligent adjustments form that setting as listening conditions change. A mark should not be places on the gain control to indicate a setting from which the patient will never vary, unless it is apparent that the patient will not be capable of learning to set the gain control accurately by listening.

Hearing aid users must acclimate themselves to the unaccustomed loudness and quality of aided listening. During their first amplification experience, patients usually comment about the audibility of forgotten background noises and the loudness and peculiar quality of their own voice. To implement the adjustment, the patient should begin practice hearing aid use in a quiet place, listening to simple signals. The listening situation should be structured and controlled. It should progress gradually to noisy places and complex signals. That is, the final goal is performance in nonstructured, uncontrolled situations. A possible hierarchy of listening experiences is suggested below.

1. A good beginning place for the new hearing aid user might be a quiet home living room. One person should talk about familiar, everyday things. For a child, a toy might be used which makes a sound accompanied by a visible source in different positions and at varying distances.
2. May be next, the listener might move to the kitchen, where the acoustics are not quite as good. Listen to one person talking or to water running at different levels, but not too loud. With children, stress the visualauditory association.

3. Next the patient might try listening to television in a quiet room. The first experience should be with easier situations, such as the news or programs of familiar music.
4. The aid should be worn next at quiet dinner table.
5. Engage in conversation in a quiet room with two, then three or four other people.
6. The aid should be worn outside in a quiet place, perhaps the backyard. The goal is to acclimate to wind noise.
7. The aid may be used at church, a lecture or a play. The patient should get as close to the speakers as possible.
8. The wearer should take a quiet drive in the country, with the windows closed to reduce noise.
9. The patient should walk along the street in a quiet neighborhood.
10. The patient should take a drive with the car windows open.
11. A shopping trip should be arranged.
12. The patient should try wearing the aid at a party or in a room where a number of people are talking.

At some point along this route, patients may discover they get along as well or better without the aid. This discovery does not mean they cannot benefit from an aid, but that they may choose not to wear it under certain conditions. A careful program of experimentation will not only orient individuals to wearing a hearing aid, but will help them become efficient and intelligent hearing aid users.

While the above program is being carried out, patients should also practice listening to and identifying sounds. There are many sounds they will not have been hearing at all before using the aid. They should relearn to identify these soft sounds, or in the case of children with congenital loss, strive to learn them for the first time. There may be other sounds that could be heard without the aid. Now they will be louder and have a different quality, and patients should practice listening to them also. At the same time, they should get reacquainted with the sound of their own voice. They should strive to re-establish correct loudness control. Some one should listen to them as they practice. They should also practice adjusting the gain control quickly, unobtrusively and accurately for comfortable loudness under different listening conditions.

Along with learing effective hearing aid use, the adult hearing-impaired patient should explore other aspects of audiologic rehabilitation. Depending on the person's need and abilities, such a program might include auditory training, speechreading instruction, assistance with effective listening strategies and assertiveness training. Additionally, many patients may benefit from information about the use of supplemental sensory aids such as telephone amplifiers, induction loops, radio-frequency amplifiers, earphones for stereo, radio or television and visual or vibratory alerting devices. The supplemental sensory aids just described may function more efficiently than conventional hearing aids in special listening situations.

2.11.9 Additional Requirements for Children

Additional steps in learning to use an aid are necessary for young children, especially those with severe or profound congenital loss. Such children have problems which require extensive training in listening, language and speech. These topics are

covered in other chapters, and only counseling about learning hearing aid use will be covered here.

Parents of hearing-impaired youngsters should listen to the child's aid daily. To do this, they will need an individual earmold or a hearing aid stethoscope. Either can be obtained from hearing aid dispensers. Parents should be sure that speech through the aid has its usual loudness and clarity, that the aid is not generating extraneous noises and that it is not intermittent in operation. Regular audiologic evaluations, including assessment of hearing aid function, are an important part of the program.

When use of the amplification is first undertaken, there may be a problem keeping the aid on the child. If the child has a lot of residual hearing, the meaningfulness and utility of sound may already be obvious. Otherwise the benefits of a hearing aid will not be immediately noticeable and the child may object to the foreign, noisy device.

Parents themselves must be convinced and committed. Sometimes parents make only a half-hearing attempt to get the child to wear the aid. For one thing, the aid is a constant reminder of the defect. Some parents are not ready to tolerate advertising to themselves and others the existence of the problem. Additionally, a good habilitation program is a lot of work, and some parents may scarcely be capable of the effort. In these cases, failure of the child to adapt readily to the aid may provide a tempting excuse to unload the burden of responsibility and effort associated with teaching good hearing aid use. To prevent these problems audiologists must effectively explain the loss and the need for the aid. They must answer the parent's questions and support their involvement in the habilitation program. They must help parents see the long term implications of a training program, or the consequences if no training program is undertaken.

Down (1967) recommended a step-by-step procedure for helping a child learn to accept and use an aid. With adjustments in particular cases for age, magnitude of loss and other individual problems, it should be very useful. The essence of the program is presented below. The instructions are addressed to the parents of the hearing-impaired child.

During the first week, indicate to your child that you plan for the aid to be worn for four short periods each day. Then do it; be in charge of the situation. Put in the earmold without turning the aid on. If the child does not object, play quietly for 5 min and remove the aid. If there is resistance, gently immobilize the child, recruiting whatever help you need. Proceed as before. As soon as the child tolerates the aid, turn it up to a low gain setting, talk quietly and play with a favorite toy for 5 min. Set the volume control a little higher. Play quietly for 5 min, then take the child exploring around the house. Point out sounds. Make it clear you hear them.

During the third week, extend the periods to 30 min each. Turn the volume control up a little more. Place the child near you and call attention to sounds that occur.

In the fifth week, utilize four 1-hr periods of hearing aid use per day. Use the gain control recommended by the audiologists.

Thereafter, increase hearing aid use until, by the end of the second month, the child is wearing the aid during all waking hours, unless part time use has been specified by the audiologist. Exceptions might be three 10-min rest periods per day and during rough play outdoors. In addition to the suggestions of Down above, other recommendations for orienting children and adults to hearing aid use may be found in

Seligman (1962), Pollack and Downs (1964), Ross and Lerman (1966), Pollack(1970), Northern and Downs (1974), Hodgson (1981) and Matkin and Hodgson (1982).

With the onset of adolescence, a time when children become more aware of appearance and concerned about being different, a long time hearing aid wearer may reject the aid. In such instances, the following suggestions may help. The importance of the child's concern should not be belittled. An atmosphere of understanding and concern is important. Prevention, of course, is better than cure. A good training program and a history of successful hearing aid use may reduce the tendency to reject the aid. Efforts should be made to help the child see that there is less difficulty with the aid than without it. Cosmetic appearance should be improved when possible. Parental attitudes and parent-child relationships are important. Adolescents (and other people) need a lot of support.

CHAPTER 3

3 DATA COLLECTION

3.1 Questionnaire Development

Consist of 10 questions responses of which are simply in YES / NO. However there is a little space for few words explanation of their answers. The questions also consist of small Bio-data information the questions of questionnaire are small and revolve around them of rehabilitation with the help of hearing aid. They cover topic like "sociability" and "adjustability" of hearing impaired with the help of hearing aid.

Q. No. 1.

Simply ask question about "usage of hearing aid" and understanding of client with it. "If client could adjust it hearing capacity to use it effectively".

Q. No. 2.

To find out weather the client is use to with hearing aid. Weather he is keeping it as something he could manage.

Q. No. 3

To see he could use or manage hearing aid alone. He know how to manage hearing aid

Q. No. 4.

It is to clearified weather weaking of hearing aid don't create trouble on if patient find it difficult to wear hearing aid.

Q. No.5.

To see weather hearing aid improve listening of the subject if they feel the same.

Q. No.6 .

If hearing aid play role in house hold on watching TV in as far as listening is concerned. Moreover if they do weather subject feel the same.

Q. No. 7.

"If hearing aid is a source of embarrassment for you the client or he may feel stigmatized" on he may feel he may be rediuced if wear hearing aid. Or it may be against decent looks.

Q. No. 8.

If hearing aid is a source of trouble or something need constant adjustment. Or if client need to set hearing aid for better listening or better understanding.

Q. No. 9.

If it is easy to live with hearing aids. If it cause trouble and you have to remove it at night or it is manageable to wear it at day time and not wear it at night time.

Q. No. 10.

If it is easy available and its repairs are easy. If patients don't feel the need of worry for its repairs and availability.

3.2 DATA ANALYSIS AND CONCLUSION

3.2.1 Meaning of Data and Data Analysis

What do we mean by data?

Data, according to Good, are the facts in isolation before the exploration of their bearing on the subject.

Whenever a research study is designed, its objectives are clearly stated and its delimitations are precisely defined so that the information or the facts are collected before exploration of their bearing on the subject.

The sources of data, the type of data to be collected and the tools/instruments of data are also well defined so that the facts or the pieces of information aimed at are collected for the completion of the research study. The facts or pieces of information collected during the conduct of the study are named as data (datum being the singular of data)

3.2.2 Types of data

Qualitative data and quantitative data. Data may be qualitative or quantitative. Quantitative data are described in the form of words and adjective, whereas quantitative data are expressed in precise and quantitative terms like numbers and figures. For example when it is said that a person has high fever, the information is in qualitative terms but when it is said that a person has a temperature of 1040F, the data are named as quantitative. When it is stated that it rained heavily, the term is qualitative but to state the measurement of rainfall in terms of inches i.e. 2" or 3" etc. will be the use of quantitative terms. In case of students achievement, the statement "Mr. Hamid is a brilliant student" is qualitative statement but to say that Mr. Hamid got 670/1000 marks or he got 68 per cent marks, will be the use of quantitative terms in the description of data.

It may be recalled that only qualitative data can be collected in respect of certain phenomena. Observation of children, illiterates, physically hand icapped and animals can initially be recorded in terms of qualitative data. If you wan to study opinion, of a cross section of people about the performance of the Prime Minister you would collect

qualitative data. While analyzing and interpreting even qualitative data, these can be presented in quantitative terms. Thus, we may find that 15 per cent thought that the Prime Minister's performance as excellent, 20 per cent.. A discerning reader would not be distracted by these quantitative terms but would keep a constant eye on the type of data on which those results are based.

Continuous and discrete data quantitative data may be continuous or discrete.

Continuous data are the observed values of a continuous variable that may take any values between the lower and the upper limits of the variables. For example in measuring mental and physical traits of most of the variables with which the researcher deals, falls into continuour series, which is capable to any degree fo sub-divisionk though in practice, divisions, smaller than some convenient unit, are rarely met. It can be measured with different degrees of ewxactness depending on the measuring instrument. Weight, for example, is a continuous varialb. It can take any number of possible values between zero and infinity. I.Q. is another example of continuous series. It is usually considered to be increasing by increments of one unit along and ability continuum, but theoretically, we measure and calculate I.Q. into andy fraction i.e. 102.6 or even 102.68. Physical measures, mental measures and achievement test scores fall in continuous series.

Some examples of data falling in continuous series are as under;

Measures of length: inches, feet, yards, kilometers etc.

Measures of weight: Grams, Ounces, Pounds etc.

Measures of time: Seconds, Minutes, Hours, Days, Years etc.

Achievement score: 50/100, 60/100, 65/100,

66.5/100,66.32/100 etc.

Mental ability score: 100.2, 100.58 etc. and other I.Q. scores.

Measure of money: Annual development and current expenditure on education.

Discrete data are the observed values of a discrete variable. These data may be the sum of observation of variable that only certain variable values and no intermediate values. The data which exhibit real gaps fall in the discrete series. An avrege family in a certain community may be reported to consist of 3.24 children, though there is obviously a real gap between three and four children. In actual practice there can never be fractional numbers like 3.24 or 3.5 or 3.75 in a family. The family will have either three members or four members, but the census report may be any fraction between the whole numbers. The numbers of students in a classroom may be 20 or 21, but it will never be 20.5 or 20.25 in actual practice. The number of players in a team is a discrete variable. It is possible to have 1, 2 or even eleven players but never 6 ½ or 6 ¼ players.

3.2.3 Data analysis

"What do we mean by data analysis? is another question to be going further un this unit.

Analysis, according to Good, is a process of resolving any problem or situation into its component elements. It is the process that starts with an assumption of the truth and then it passes through a chain of sufficient condition to the given data or to something accepted as true. In some contexts it is used in contrast to synthesis.

Statistical analysis means the application of statistical process and theory to

Compilation

Presentation

Discussion

Interpretation of numerical data.

Data processing is another term usually confused with data analysis. It is preparation of source media which contains data or basic elements of information and the handling of such data according to precise rules to accomplish such operation as classifying, sorting, calculating, summarizing and recording.

3.2.4 Data Analysis by Means of Graphing

The graphic presentation of data is a valuable supplement to statistical analysis of data. The graphic or chart tends to attract the readers attention. A graph is an effective method of clarifying a point. One small graph will often make a point more clear than a dozen tables and paragraphs. The graph speaks out its message and is more concrete in the presentation of data. Graph is a measure of presenting analysis of subject in a better way than is possible in a written text.

Representing a Frequency Distribution Graphically

The ordinary frequency distribution does not give a very clear picture of the situation.

Histogram is a series of columns, each column having, as its base, one class interval and as its height, the number of cases for frequency in that class.

3.2.5 Inferential Data Analysis

Inferential statistical analysis involves the process of sampling. In this process you make selection of a small group i.e. sample, from a large group called the population or universe. A statistic computed from a sample may be used to estimate a parameter, the corresponding value in the basis of sample data is statistic and a population from which it is selected. Briefly a measured value on the basis of sample data is statistic and a population value inferred from a statistic is a parameter. Inferential statistical analysis

involves the selection of sample from population so that inferences about parameter are made on the basis of statistic computed from the sample.

Inferential data analysis is useful for you as you apply it for computing values on the basis of randomly selected samples and applying these statistics for inferring the population values i.e. parameters.

Your primary job, as a researcher, is to discover universal principles and generalization, but it is impracticable for you study a whole population. This process of sampling in the inferential data analysis helps you in reading generalization on the basis of sample statistics.

For example, the problems of the heads of educational institutions in Pakistan are to be investigated. The population for this study includes heads of all types of schools, colleges and universities besides other institutions like medical colleges, polytechnics, etc., where teaching-learning process is carried out. If you contact all the members of this huge population, it will take you such a long time to reach the conclusions, that by the time you investigate the problems of heads of institutions, the nature of their problems might have changed. It is, therefore, feasible to draw representative samples from this population by the use of some standard sampling procedures and investigate the problems of heads of institutions included in these samples. The problems of heads of the total population of the study i.e. population values can be inferred on the basis of these sample values i.e. the statistics. This procedure waves you from undue wastage of time and energy and provides approximately accurate results about the population.

It is, however, necessary that the individuals selected be chosen in such a way that the sample approximates the population. This approximation can be assumed making

possible the estimate of population characteristics by an analysis of accessible data. Parametric and non-parametric tests help the researcher in this respect.

3.2.6 Parametric Tests and Their Application

Parametric tests are the most powerful tests and should be used if their basic assumptions can be met. *The central limit theorem* says that if a number of equal sized large samples are drawn at random from an infinite population, (a) the means of samples will be normally distributed, and (b) the means of the sample means will approximate the mean of population. The belief that an adequate sample is a small carbon copy of the population of teachers in Pakistan are selected, the mean ages of the samples would be different. The variation of these samples means is due to sampling errors. However, according to the central limit theorem, the mean of these sample means will approximate the mean of the population.

In brief, statistics is helpful to you, as it enables you to make inferences about a population from your observation of characteristics of a sample. Although the sample does not duplicate the characteristics of the population, and although samples from the same population will differ from one another, the nature of their variations is reasonably predictable. The central limit theorem describes the nature of sample means and enables the researcher to make estimate about population means (parameters) with known possibility of error.

Sampling theory helps you in the analysis of many problems faced in education and helps you in making certain decisions. These statistical decisions are not, however, made with certainty but are based on the probability estimates you apply the concepts of

central limit theorem, sampling error, null hypothesis and level of significance in making these decisions.

A null hypothesis says that there is no significant difference between two or more parameters. It tries to judge as to whether apparent differences are real difference or they are due to sampling error. You formulate a null hypothesis and your hypothesis is that any difference between the mean achievement of the tow sample groups at the end of the experiment is simply the result of sampling error as explained by the central limit theorem.

If the difference between the mean achievement of experimental group and the control group too great, you may refute or reject the null hypothesis, saying that it is not true that the apparent difference is merely the result of sampling error. You may conclude that the experimental variables or treatment, not the sampling error, accounted for the difference. Here you can use a statistical test to discount chance or sampling error as variable

If the difference between the mean was not great enough to reject the null hypothesis, you accept it and you accept that there was no significant difference and the apparent difference was due to the sampling error or chance.

The rejection or acceptance of a null hypothesis is based upon some level of significance. In educational researches, the 5 per cent level of significance (0.05) is often accepted. A more rigorous test of significance is one per cent level (0.01). Statisticians do not deal with the decisions based upon certainty. They merely estimate the probability or improbability of occurrence of the events. Rejection of a null hypothesis, when it is really true, is known as type I error and accepting a null hypothesis when it is really false is

known as type II error. Setting a level of significance as high as .01 level minimizes the risk of type I error but it increased the risk of type II error. Rejecting a null hypothesis provides a strong test of logic. For Example, before a court of law, a defendant is assumed to be "not guilty" until the "not guilty" assumption is rejected. This "not guilty" is comparable to null hypothesis.

3.2.7 Result preparation

After completing Questions questionnaire administrations one piled up all questionnaire together to prepare results. For result following procedure is adopted.

1. Sign allotment

First of all, all that response which are in favor of hearing aids or which point out that hearing aids are important in rehabilitation process are sign as " + " and the response which are not favor the hearing aid as tool response of rehabilitation process is sign " – " all questions and their response are evaluated and assigned " + " or " – " sign. Then + or – sign are counted and scores are written on table. (Table 1 in appendix)

2. Statistic Analysis:

Statistical analysis is then applied to these scores. First of all ± of both are calculated than " σ " (standard deviation) is calculated. Afterward "t" test the hypothesis seprate table. Table 20F appendix is prepared.

The result of "t" test either reject or stand null hupothes (a hypothesis denies research hypothesis). In this research result are rejecting null hypothesis. Thus research hypothesis "the hearing aids play a role in the rehabilitation of hearing impaired" Stand. Percentage are considered in "t" test to avoid any sampling error due to small sample.

4. Factor analysis

Individual questions are analysis. The questions which are controversial or which show negative results are discussed same is positive results.

Q. No. 1.

Score are 100% in favor of hearing aids thus, every body feels that they could controle and use hearing aids.

Q. No. 2.

Score are 100% in favor of idea that one could clean hearing aid easly.

Q. No. 3

65 % response are in favor of hearing aids and 35 % not in favor. Thus most of the hearing impaired feels that they could tackle with hearing aids themselves.

Q. No. 4

95 % responses are favor of the fact that with hearing aid and one could comfortably and better than before.

Q. No. 5

95 % of client believe that they could watch TV and could not do other house hold jobs better than before.

Q. No. 6

60 % believe that they could wear hearing aids easly whole day long only 40 % believe that it is difficult to wear hearing aid whole day. They remove hearing aids at the time of rest.

Q. No. 7

75 % Patients believe that they don't mind wearing hearing aids however, 25 % don't like hearing aid due to cosmetic reasons i.e. it is no appear decent to wear hearing aids in a crowd.

Q. No. 8

55% patients believe that they need to readjust hearing aids many time a day only 45 % don't feel like that. Thus one problem with hearing aids is they need constant adjustment.

Q. No. 9

95 % hearing user know that they must remove hearing aids at night time and must wear it at day time.

Q. No. 10

70 % of the patients feels they could easily get hearing aid & could ask their repair only patient outside the city face problem.

3.2.8 Limitation of results

1. Sample is small n=20 it may suffer from error
2. it could not be generalized to large extent
3. Research only covering few variables related with rehabilitation.
4. Research mostly related with adjustment at home

3.2.9 Remedial Solution

1. in place of actual scores "Percentage score" are used to "Calculate" "t" score. To reduce sampling error while calculations.

2. Results related to previous finding or theoretical fram work on literature related to the research must elaborate.
3. A good research problem must not be too wide which cover wide range of variable. This loosen the grip of research, the score of the research are become.
    a. In valid
    b. Unreliable

    Only few variables which could be measure purely are important to test in a research.
4. Related variables must funnel down and must be tested in research.

3.2.10 Conclusions

We conclude that;

1. Majority of subjects believe that we could control hearing aids and could use it independently. This in every day living majority of subject know how to adjust hearing aid how to manipulation of switch for beter adjustment.
2. majority of clients could clear hearing aids in every day routine living by themselves. So that they are capable of maintaining their hearing aid by themselves. Thus they could keep hearing impaired independently and could use them freely.
3. 70 % of the client feels they could change batteries by themselves and could manage hearing aids and could check their functions.
4. What about subjects hearing capacity 90 % of the subject believe that they could improve by using hearing aids. Thus hearing aid clearly play a role in “audiotory training” of a subject or it is a tool against deafness.

5. 90 % believe that in every day household functions e.g. TV watching cooking etc. hearing could be of great help. They could improve our listening level increased our functioning capacity with reaches a Deaf person could perform much better in home as compare to the time before when he is not using the hearing aid.
6. 70 % believe that it is not easy to use hearing aid whole day long because of it burden on ear or in case of body worn they are difficult to manage e.g. because of ;
    a. loudness of ear plug or ear moulds
    b. Damage of wire
7. 75 % subject feels imbursement of using hearing aids they usually try to hide their hearing aids or feel imbursement in front of a crowd. Their hearing aid must be small and lighter in weight must be discussed and could be hide when wear.
8. 60 % find it difficult to set and reset their hearing aids during whole day functioning. The hearing aids wear whole day long behind the ear must may cause acting, allergy pressure similarly body worn aids need constant adjustment. However 40 % of the subjects loops with the problem of wearing hearing aids.
9. 100 clients know that it is necessary to wear hearing aids at day time. We must not wear hearing aids by night because it may be damage or broken otherwise it is not necessary to wear.
10. Now a days facilities of purchasing hearing aids and hearing aids repaire like Faisalabad. 60 % of subject find it easy to buy hearing aids and ask for repairs if required.

3.2.11 Inference Drawn

Thus from above result one could draw inference that research hypothesis "hearing aids play a role in the rehabilitation of hearing impaired", Stands or research hypothesis is true.

1. hearing aids are necessary for rehabilitation
2. Usually people believe that hearing aids play a role in social rehabilitation.
3. This result is confirmed by various statistical analysis e.g.
    a. T – test
    b. Factor analysis

Also shown on Double Graph and simple Histogram and pie Diagram.

3.2.12 Graphic presentation

1. Double Graph

In this Graph presentation of YES and NO are drawn along Y-axis and no. of subjects drawn along X-axis. This graph show range of percentage where positive or Negative answer could be seen clearly. Graph representation show mark difference between positive and negative answer

1. Positive and negative answers do not touching each other.
2. There is a mark difference between these two answers.
3. This clear difference on graph show that positive response has more value as compare to negative response. Or positive response most obvious as compare to negative response.

2. Histogram:

Show positive score of each subject as well as negative score of same subject. There is a more difference between two histogram positive histogram show mark differences (i.e. much higher than other histogram). Difference between two is “S Points” or more” thus these results also show that research hypothesis stands “Hearing aids play a role in the rehabilitation of hearing impaired

3. Pie Diagram

If drawn “to show comparison between Means” of positive and negative percentage. This diagram also show that more than 80 % positive response cover much space as compare to below 20 % negative response in this way we could say that. It is batter of time and practice that a hearing impaired could learn to use hearing aid as a tool of getting rid of hearing impaired.

CHAPTER 4

4 DISCUSSION

4.1 Introduction and Discussion Of Vital Concepts

The question rise in problem statements "what is the role of hearing aids in the rehabilitation of hearing impaired"

Here we need to discuss few concepts in wider sense.

Issue related to the rehabilitation of hearing impaired

Behaviorism

Rehabilitation of impaired person behavior

Is rehabilitation is change in behavior? (Toward hearing aids) as we could see in this research

4.1.1 Introduction

"Behavior is the movement of an organism of its parts in a frame of reference provided by the organism or by various external objects or fields" (Skinner.1938). Another conceptually sound and comprehensive definition of the concept is put forwarded by Johnston and Penny Pecker (1980) according to this:

"Behavior of an organism is that portion of the organism's interaction with its environment that is characterized by detectable displacement is space through time, of some part of the organism that result in a measurable change in at least one aspect of the environment".

Behavior is a continuous process which moves through these development stages with time.

i. Continuous and orderly

ii. Results in long lasting changes.

iii. Results in more advanced, superior type of functions.

Every growth is similar but also unique while socializer's reinforcement, punishment and modeling also share in psycho-social adjustment. Society approves some type of behavior while it also condemns some other type of behaviour. In developing behaviour patterns, chemical actions in brain join with rearing practices, teaching etc. Greek physician saw behaviour as a result of four bodily fluids in human-blood, phlegm, yellow, bile cholar, and black bile Alberto (melancholy)

Another valuable study is of Thomas, Chess and Brich (1968) which divided behaviour into nine categories.

Activity, rythimicity, approach to withdrawl, adaptability intensity of reaction, threshold of responsiveness, quality of mood, distractibility, attention span and persistence.

Human-behaviour remains extremely difficult subject matter (Skinner, 1969) while research has proved that study of abnormal behaviour is much more difficult and it may be due to some disorder of chemical or structural balance of body i.e. biochemical, bio-physical. Many explanations of behaviour pattern may be found in Sigmund Freud's theory, stage theory of Piaget. Kohlberg and Turiel's theory of mood development. So adaptive and maladadaptive behaviour pattern are learned and learing is result of consective events.

Behaviour assessment as defined by Linechan "is to figure out the clients' problems and how to change it for the better. While assessment in the opinion of Hawikins et-al (1979) proceeds through these stages.

1. “screening and general description
2. Definition and general quantification of problems or desired achievement.
3. Pin pointing target behaviours to be treated.
4. Monitoring progress.
5. Follow up.

Analysis of bahaviour is an aspect which counts in adjustment analysis may be carried out before, in or after assessment. It is a debate of psychiatrists, psychologists, social workers, teachers, judges, legislators and handicapped themselves. All of these are concerned with appropriate behaviour development. While planning for appropriate behaviour one should distinguish between facts and opinions. If for a moment, we ignore all psychological and social aspects, man emerges as a machine. A machine with impairment cannot function to its full capacity so an engineer is required to maintain and repair it. In this way disabled persons also need rehabilitation. Human body has different systems which function rethemically. Any disturbance in function needs to be tacked on wider front. Expension in scientific and technological boundries has developed new horizons of services for the handicapped. A multidisciplionary, community based rehabilitation design cab desirable results because of its flexibility.

4.1.2 Normal and exceptional pattern of bahaviour

“Every structure has a foundation. The modern science of child bahaviour is built upon briks of history, theory and methodology” (White Hurst Vasta, 1977)

Patterns of child reading practice vary from family to family, from generation to generation. Consistency in these help to promote behaviour growth, which is the function

of interaction between organism and environment. The biological aspect determine various stages of appearance of behaviour at appropriate developmental levels while environment provides stimulation for behaviour development.

Many of the behaviour disorders are due to serious faults in the emotional aspect of reading. It is believed that emotional aspect is partly a biological process. It also has physiological basis. Aggression, dependency and prejudice precipitate behaviour disorder because human behaviour is interdependent with other people. Children usually learn to behave the same way as adults interact with them. The perception gained in this regard is an important factor in the development of behaviour.

Every child grows in his own behaviour which is appropriate in one culture may not be acceptable in an other culture. It it may be normal or abnormal in accordance to the culture pattern because each culture has its own set of beliefs and behavioural. We may look into various styles of growth as there is variability in beahavioural manifestation of human nature.

Stimulation and deprivation have specific effects. Positive stimulation may have a positive response while deprivation may cause one. While making provision for stimulation timing and duration of its administration may be consider. Effects of positive reinforcement are deep, tender and rewarding in its nature.

Body conditions such as strength, energy, state of senses have relationship with efficency of different modes of beahviour, learning and adjustment i.e. physique associated behaviour.

In particular variation in physical energy and body sensitivity appear as important links between physique, structure and general behaviour.

The handicapped may show inferiority in feelings, self conseiousness. Lack of self confidence, fearfulness and depression as noted by Hewett Froness (1984).

Now let us study Kauffman (1985) who has analysed the factors which influence childs behaviour. Surely it will provide you a basis for better understanding of the topic.

According to Kauffman, family structure provides a basis for behaviour analysis of the child. Role of father or mother and role assigned to child are complex. Father's absence and any other unstability towards home structure, produces disorder in children's behaviour negatively, but all the factors that contribute towards disorder are not known yet.

Kauffman has discussed conceptual modes of family influence on behaviour analysis of family interaction.

Behaviour pattern is judged by primary criteria. The criteria established by Hewett and Froness have three components. Man is basically a social creature in his nature but quite a large number of elements affect him.

Visually impaired children: Visually impaired persons use their hearing capacity in social contacts but their social contacts remain uncertain and frustrated. They feel rejected. If blind are praised, their academic score rises. A study also suggests that suffering is due to social pressure not because of blindness. Studies on behaviour of the blind show that blindness does not cause psychological or development disturbance but the disturbance depends upon the experience the blind person has of his environment.

Hearing handicapped individual: the higher the loss, the higher the degree of difficulty of interaction. The behaviour of the hearing impaired is the result of isolation because of difficulty in conceving emotions of their peers, hence deaf lack maturity of

social interaction Deafness from early childhood produces stress, the influence of which can be seen in his behaviour.

4.1.3 Psychological adjustment and handicapped

Disability is experience objectified in its nature while handicap is experience socialized (Philip and Duck Worth. 1985). So therefore handicap is a social deviation when environment is negatively stigmatized: majority of the handicapped feel difficulty in adaptation to the environment.

In Pakistan social structure is mainly based on economic and cultural factors. Our socio-economic system has various classes, moreover lack of education in rearing of children is also accompanied by want of information about the management of disabled persons. Social, education and psychological patterns are at present in a transitional stage. This process of change has implications for the rearing practices regarding the disabled which have become less helpful than in earlier times.

As normal children can develop emotionally and socially in a satisfactory way but handicapped children may show of maladjustment in their attitude, continuous maladjustment can defective moral development. Support and positive attitude will help the handicapped in developing constructive approach to situations because any situation is the result of so many interlinked factors.

The most favorable situation for adjustment for the disabled is the home where disabled can gain optimum psycho-social adjustment. Family has received world wide recognition as the primary socio-cultural institution. The first contact of an impaired child is with his parents who provide biological and cultural heritage for adjustment. Close and warm interaction tends to provide stability and maturity adjustment. Living in society,

cannot be free of tolerance without, withdrawal and aggression. When a disabled person comes in contract with others, he is never sure what aspect of him will be used (Breachin et-al 1983). Either they will treat him as an object of pity, shame, holy innocent, sick; object of ridicule may concentrate on disability by imparting sympathetic response which gives psychological and social meaning to the adjustment of handicapped. For better adjustment, gentle, loving, consistent conditions are required. As a result of this psychological integration a rational personality evolves; sum total of through, feeling and actions that a person habitually has in his future life (Linn, 1980).

Barker, "study on physically disabled," concludes that maladjustment is common. The degree of maladjustment is greater than that in normal persons, overall result of physical handicap. Degree of maladjustment is proportional to the longevity of handicap, but if crippling occurs at adult life, it does not affect the personality. Attitudes of parents affect physically handicapped children more than their normal peers.

Motivation: All children have some kind of aspirations. However, handicapped may have different or inadequate means of satisfying these, the gap between these can be bridged by proper motivation.

Affection and recognition: The urge to get one's worth determined by others is a natural instinct. Recognition of physical beauty, strength and ability occupy a prominent role in the social acceptance. When stress is on physical qualities, physically handicapped may feel depressed, but love for physically handicapped as a unique individual will help to eliminate this distress.

Self realization: Body image and self realization are interlinked. If crippled person is negative about his body, he should be helped to regain faith in his physical competence to enhance his body image.

Security: There are many types of security. If physically handicapped is provided with more security than required at home, then teacher should adopt an appropriate attitude to balance it.

Frustration: As there is limitations associated with impairment the ways to fulfill the aspiration which are similar to normal children becomes limited. Response to frustration is aggression; physically handicapped may response in one or several ways as enlisted by Kirk.

The role of school: Studies have been conducted by experts whether it is possible to produce better adjustment in special schools. Both have their own advantages and limitations. It is better to policy of achieve good adjustment.

Assessment of Strengths and weekness: Assessment of Strengths and weekness of human behavior aims to provide helps in most satisfying and effective living. Human behavior is emergence of individual within culture. When we assess the individual we only assess the pattern through which an individual has reacted to the environment. The process of origination of experience and reaction to the dynamic and continuous in its nature.

Assessment provides a view of individual identifies and evaluates his difficulties and traces alternative ways of action.

It is not a single-area-based-process; psychologist should look for help from social workers, educator, psychiatrist and parents. There are many factors which operatc

together in the process of assessment which is collection, interpretation of information about a person and his situation. Another definition describes assessment as "description, explanation and prediction of behavior of individual in their natural situation."

Clinician is a man who is not biased, he is objective in his approach and well informed about assessment techniques. In clinical setting usually projective techniques are employed. Decision based on assessment helps the clinician making of specific value e.g. entering in the institution, occupation entrance, marriage etc. Helpful "general aspects of decision theory, as mentioned by Sandburg, Taylor are:-

1. "emphasis should be on pay off or outcomes not on specific techniques.
2. questions of validity of test or other assessment activities should be considered as problem of improving on existing procedure rather than improving on chance.
3. strategies of assessment or whole sequences should be object of concern. One asks

   about the contribution of both test and non-tests procedures.
4. examination of values is fundamental to assessment . precisions are made that will maximize movement towards goals.

Assessment should be administered positively and with ethical responsibility.

Here is Hogg & sebbaa,s work for your reference.

Impairment may affect the developmental task of an individual. Hogg and sebba in these pages have discussed some techniques of assessment.

Intelligent quotient (I.Q) or developmental quotient (D.Q) is the tern used in traditional ways employed to measure intelligence but in measuring cognitive function. We have to adopt a different approach when we are considering mentally retarded psychometric tests have no concern with the developmental stages of child and you not give any clue how behavior changes from one level of mental development to another level.

Inhaler's approach was extended to children who are profoundly retarded and whose sensor motor development is telayed. Dunst pointed out differences between piagetion tests and traditional psychometric tests both in terms of composition and style of administration.

Multidisciplinary approach towards rehabilitation of the handicapped rehabilitation includes all measures aimed at

1. reducing the occurrence of impairment (first-level prevention).
2. limiting or reversing disability caused by impairment (second level prevention) (dispensing hearing aids)
3. preventing the transmission of disability in to handicap (third level prevention) (auditory training)

as this process involves many fields. It seems necessary to look in to the guiding principles of disability prevention and rehabilitation before we study actual material.

4.1.4 Guiding principles for a strategy of disability prevention and rehabilitation

An international undertaking to bring about changes and improvements should be based on the following principles.

Expanded and more effective efforts to prevent childhood impairment are essential. They should be for the most part, components of more general programmes for the development of health, nutrition, welfare and education. (Education involved hearing aids dispensing and auditory training)

Primary attention must be given to the preservation of the normal process of child development to the greatest extent possible. The validity of any intervention with an impaired child must be measured by its relevance to normal child development.

The family is the most important instrument for the preservation of normal child development process, and its capabilities to deal with the problems of impairment must be strengthened and supported.

Community-level resources and action, if motivated and fed with improved information an provide most of the support needed by families to overcome the difficulties resulting from childhood disability.

Relevant aspects of existing doctrines should serve as the foundation for such an undertaking.

-- accepted principles of child development;

-- the UNICEF concept of basic services for all children;

-- the concept of primary health care (PHC) as elaborated by the international conference on primary health care in alma-ata in 1970, and similar approaches to the delivery of basic services for education , social development and vocational preparation . the application of the PHC concept to the health aspects of disability is well described in the policy on this subject approved by the world health assembly in 1976(WHO, Geneva ,A29 INF,DOC 1,28April 1976)

Concepts of provision of hearing aid technology among developing countries (TCDC).

Although valuable initial work has been done by N.G.Q's. medical profession is also playing its role. However, efforts in the area need enrichment and expansion to cover a wider spectrum. Approaches to rehabilitation may be evolved on better health services, better nutritional practices. Provision of basic and family education strengthening of families and communities.

The poverty is one of the principal root causes of disability especially in rural areas of developing countries and it needs to be strongly emphasized poverty influences nutrition and child rearing practices also.

In this reference traditional professional fields and newly evolved areas have been discussed. Golden son divides professional into medicals, non-medical and paramedical categories. Fields which are relatively more important for Pakistan are included in the pack. Psychiatrist, neurologists, while non-medical specialists comprise rehabilitation psychologist. Social worker, rehabilitation nurse, special educator, optometrist, speech pathologist, audiologist. Orientation mobility instructor, and volunteer worker.

Another category of rehabilitation professionals comprises of allied medical and pharmaceutical professionals, genetic counselors, bio-medical engineers, osteorhaphy physician, orthotist and prosthetist, laboratory technicians.

Some of the rehabilitation professions may be new to our country but their important role cannot be neglected while rehabilitation, maintenance and prevention measured are being planned. Specially as far as rehabilitation via hearing aids are concerned

4.1.5 Role of community based supportive programmes

Rehabilitation means returning of ability or helping the disabled person to manage better at home and in the community (Werner, 1987). It is a process of meeting the needs of disabled to male them self-reliant, productive for themselves and for the society. Rehabilitation also aims to create a new social set up which will be more accommodative to disabled person.

Effectiveness of community based rehabilitation depends upon the quality of opportunities on the area such as economy, management, education, political will, and religious efforts. In a society like ours poverty plays a significant role in converting impairment into handicaps. Financial assistance to the disabled and help to their families in acquiring services and specific aids by useful. e.g. providing hearing aids with nominal expenses.

In the process of rehabilitation the role of professionals and therapists are extremely impotent. e.g. provision of ear mould is important.

Another aspect which is of considerable importance is “Secondary Rehabilitation”.

Medical professionals also place emphasis on the secondary rehabilitation. As the stage of handicapping is social in its nature, so rehabilitation should aim to prevent occurrence of impairment. It should be initiated from the point where it is though to be important. The most concerned persons in this process are disabled themselves and their families but while providing support, it should always be kept in mind that the care and supporting services be made available to that extent which is required to develop the full

potential of the disabled. So that they can become useful members of the society (Naseer, 1988).

World wide, there is no single accepted rehabilitation programme. It is better even necessary, to develop our own plan according to our cultural needs. The most prominent hurdle is non-availability of trained manpower; next constraint the gap between identified national resources and requirement of rehabilitation programme. While planning, these two factors should be considered, specialized professionals are needs to be trained as co-workers at different levels of competencies. These may be family members of the disabled.

Decentralization of services and facilities may put wheels to the process of rehabilitation. Developing small community rehabilitation centers at small remote place, utilization of locally available resources can help a common man to understand basic principles of rehabilitation. Depth in understanding of principles may make them to adapt the principles according to the situation being faced by co-workers.

The aim of rehabilitation process is to make the disabled functional. See child as child, abilities of disabled which are usually ignored should be given more importance than the disabilities. Basic focus should be on the child not on disability while planning for a community based rehabilitation program.

Community based rehabilitation program is of two types. Top-down and bottom up. Top-down program is designed by government and high authorities and people of the locality have to participate as directed by these agencies. In this program decision are not made by community itself the responsibility of designing the program lies with high authorities. In bottom up program, community makes the plan i.e. according to the local

needs of the disabled. They can adapt this from other communities; each of the programs has its own benefits and drawbacks.

Top-down programs is easy to access as it is well organized by the government. In this program local community center staff is usually not very popular as it lacks in leadership qualities. They may not be able to fulfill the objectives due to non-flexibilities of plan.

In bottom up approach when a decision is agreed upon becomes more interesting meaningful and useful for the disabled. It may be highly flexible and acan be adapted to every new situation.

The aims of rehabilitation programs should be based on the needs of the disabled person and society's requirement. The programs should attempt to integrate the disabled and no-disabled in the community. First involvement must be between disabled and their families. The rehabilitation program should start from the aspect which is most critical. Any person who is willing to take a start in a rehabilitation work, is known as an agent of change. Waner suggest that an agent of change should behave as "Counselor not as Boss". It will open up new horizons if we let the disabled provide leadership themselves in community based programs.

A better scheme of rehabilitation can be planned as chain e.g. small villages should be linked with towns and then towns with resources and research centers. Any rehabilitation process should start from what is most important and in this respect; popular demands may also be considered. "it could be hearing aids" as one could predict from its popularity and effectiveness.

4.2 COMMUNITY BASED REHABILITATION

4.2.1 Introduction

There is no person who is independent of his community greatest influence is exerted on infants and children by their first community i.e. home and neighborhood. If a disabled child is isolated, his behavior is likely to be sub aerial, his response toward himself and community may lag behind and physical emotional, intellectual and verbal development may suffer. It is worthwhile to mention that most of personal behavior of the disabled derived from the community life itself. Human behavior not only depends upon instinct but also not social and cultural environment.

The effective ness of kinship and community is related to their ideas and experiences about handicap. Kinship is a “mini community” and is immediate group capable of providing a sense of we-ness. It is highly personal nature. When a handicapped child is very young, he is generally accepted by other fellows but as the handicapped child grows, the degree of rejection also increases. For this rejection, many factors can be held responsible but a good deal of effect is headed to counter-act the influence of these factors.

The parents of handicapped child may also feel uncomfortable and unequal members of the community. They cannot enjoy many of the experiences like their other fellow being with normal children. This uneasiness gradually gives rise to the thought of binding themselves into an organization to gain a voice for their needs.

4.2.2 Community

The development of social contacts with others is a human necessary. If any one is raised in isolation an abnormal personality will most likely be the out come. Because of

contacts with others, a child share experiences and develops understanding which helps personal growth.

A community is a big unit in the social order. A carries some hidden meanings which can be seen in the action of individuals. Community study is a social phenomenon but is not easy to inquire in to it because it involves the study of complex behavior of a man while a community is more than its members. The community influences the handicapped has a force to which he respond in his unique way.

The idea of community is evolved when the interests and needs of peoples of an area overlap. There is not a single agreed definition of community but two factors, that is area and social interactions are common in most the definitions. Dressler elaborates these two into four sections:

A community has space and residents to interact directly and indirectly. This relationship may be due to face to face contacts have in the small villages or contacts may be through media. Every member of the community may feel his membership and existence in the community, while the concept of space has diversified our concept of community from room to state or even beyond the state.

The community is small focal point where basic services for living can be provided and maintain. it is the oldest form of social community. It also acts as a guardian of tradition. Member has common ground to share. An ideal community is intellectual but industrialization had changed its limits. Many type of community have immerged as a result of modernization e.g. cultural, professionals, political community etc.

A community as an ecological approach undergoes continuous changes but there are some factors which do not vary. A community can be identified on the basis of species and there is chain of dependency between living and non living organisms.

4.2.3 Socialization

Stewart & Ghynn (1985) define "socialization" as the process by which people acquire their beliefs, attitudes, and values of their culture. It also involves the development of a distinctive personality for each individual because the traits of the group are never observed precisely the same way by all people.

Socialization is not attained in isolation. It is gained through human interaction. As a result of socialization one may learn ones rights, duties obligations, approved styles of life etc.

Institutionalization of the disabled is giving way to mainstreaming (integration into the community). Support in favor of this trend is gaining more and more strength. Socialization as integration of disabled with community is being permuted especially by the mass media, N.G.Os and social workers. In Pakistan these provides the specialized services for the disabled which where previously only available at an institutions. Provision is not only made or special children but also for their social needs.

Mass media shapes the generals attitudes toward socialization as "agreed approved" of attitudes. With proper adjustment a disabled person can attain his own income source through self help, 'if the disability allowed'.

Socialization is a process of acceptance. The performance of a social role allotted to an individual and the result of socialization is social stability and continuity in stability

with accuracy. 'Life with "hearing aids" could attain on achieve higher standards of socialization.

Warmness of relations between model and imitators accelerate the process of socialization even if it is speeded up when model occupied strong position. However, it is necessary to mention that all socialization is not model centered. It involves many factors; prominent among these are the family, school, peer group, religious, and occupational groups. Socialization of the disabled is also different from socialization of non disabled people. Its deviation from normal depends upon type and severity of disability, attitude towards disability and socialization practices. For a severe handicapped, the time required for socialization is longer than normal. It is even through for mental retardation. When sub normality is permanent the socialization process may be life long and may not even then achieve its goal. Current approaches of mainstreaming also contribute towards socialization although a handicapped person may not be able to participate fully in the social order. The greater the deviation, the greater the difficulty in the process of socialization. However machines like hearing aids help in socialization.

4.2.4 Community care

Human of spring is dependents on other for a longer time than any other species. He is in need of helping hands from others. From a state of dependency to a world of self reliance, one has to take advantage of community help and care. It has multiples aspects which involve many spheres such as medical, social work, legal protection, barrier free living design and employment e.t.c.

The concept of community care is associated with human societies. Disability imposes restrictions on the freedom of in ability but friendly determine the bay of coping

with their need of disable. This pattern of coping may be regard or flexible. Help may vary from person to person and also from person to organization i.e. government, N.G.Os. Parents feel vary worried when no one is available took after their handicapped child when they go out of the house.

4.2.5 Role of the professional workers

Society is composed of individual. Some of them exhibit a dynamic role while some play a passive and limited role. As already discussed, the disable person may have a limited interaction and require some sort of help one time or and other.

Social services and professionals can perform a wide variety of interactions including counseling children, patients and families, gathering necessaries information for parents and disabled children. Professionals can also explore and help in the provision of various facilities and experiences. The role of professionals must be flexible. The effectiveness of their role depends upon educational background. Professional insight and the type of community to be served. Readiness for listening, deep observation and negotiation with parents and handicapped children and also contribute towards effectiveness of services.

The basic assumption behind the task of the professional worker is that the behavior of the handicapped is modifiable so that the processes of social integration of the handicapped cab take place. e.g. audiotory training

4.2.6 Discussion

1. **rehabilitation**

Present research.

As this research show that hearing aids do play a role in the rehabilitation of hearing impaired rehabilitation as it is a wide concept only compare:

1. keeping hearing aid independently
2. listening improvement
3. every day conversation
4. every day embarrassment
5. comfortable use of hearing aids

4.2.7 "Present research"

Pointed out importance of hearing aids in the life of hearing impaired. Even HI knows that hearing aids are important for living easy and up to the mark. Hypotheses of research positively stand amends hearing impair who believe in using hearing aid feel it as vital component in their life.

4.2.8 Story behind:

As present research is tried to find out role of hearing aids in the life of hearing impaired. Another question is, how hearing aids help in the rehabilitation of hearing impaired? There are many explanations. One most acceptable is learning theories which explain that hearing impaired like any other individuals may "learn to use hearing aids with:

1. practice (learning)
2. Efforts (repetition) on pairing of timely

4.2.9 Theoretical frame work

There are many theories to explain learning in hearing impaired, these are:

4.2.10 The behavior model

1. Origin of behavior model
2. Classical conditioning and explanation of abnormal behavior.
3. Operant condition explanation of abnormal behavior.
4. Modeling explanations of abnormal behavior
5. Assessing the behavior model.

CHAPTER 5

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APPENDIX

Table 1

Table 2

Graphic representation

App: 1

App: 2

App: 3

Table

Signification of Difference Between the Mean

(t - test) Statistical Analysis

			%					
			n=20		N = 100			
Sr. No.	X_1	X_2	X_1 %	X_2 %	X_1-ā	X_2-ā	$ā_1$	$ā_2$
1	20	0	100	0	91.55	-1.55	8381	2.4
2	20	0	100	0	91.55	-1.55	8381	2.4
3	13	7	75	25	66.55	-23.45	4429	550
4	19	1	95	5	86.55	3.45	7491	11.9
5	18	2	90	10	81.55	8.45	6650	71.4
6	16	4	80	20	71.55	18.45	5119	340
7	15	5	75	25	66.55	23.45	4429	550
8	10	10	50	50	41.55	48.45	1726	2304
9	19	11	95	5	86.55	3.45	7491	11.9
10	17	3	85	15	76.55	13.45	9860	181
			EX_1=846	EX_2=156			$Eā_1$ 59957	$Eā_2$ 1744.4

Step1 Calculation Mean of (X_1 X)(X_2 %)

X_1 % = 845 ÷ 100 = 8.45 $X_1 - X_2$ = 8.45 - 1.55 = 6.9

X_2 % = 155 ÷ 100 = 1.55

Step 2 Calculation of Deviation

σ_1 =√59957÷100 = 24.486

σ_2 =√1744.4 ÷ 100 = 4.176

Step 3 Standard error of mean

SE $ā_1$. $ā_2$ = √(24.486)2 ÷ 99, + (4.176)2 ÷ 98 = 2.49

t = 6.9 ÷ 2.49 = 2.77

Df = 100 + 100 - 2 = 198

RESULT NULL HYPOTHESIS REJECTED

Factor Analysis

+ Positive to HPT
- Negative to HPT

Question ↓ / Subject →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	YES/NO
1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	20--0
2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	20--0
3	+	+	+	+	-	-	-	-	-	+	+	-	+	-	+	+	+	+	+	+	13--7
4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	19--1
5	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	18--2
6	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	+	-	+	+	16--4
7	-	+	+	+	+	-	-	+	-	+	+	+	+	+	+	-	+	+	+	+	15--5
8	-	-	-	-	-	-	-	+	-	+	+	+	+	+	+	+	+	-	+	-	10--10
9	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	19--1
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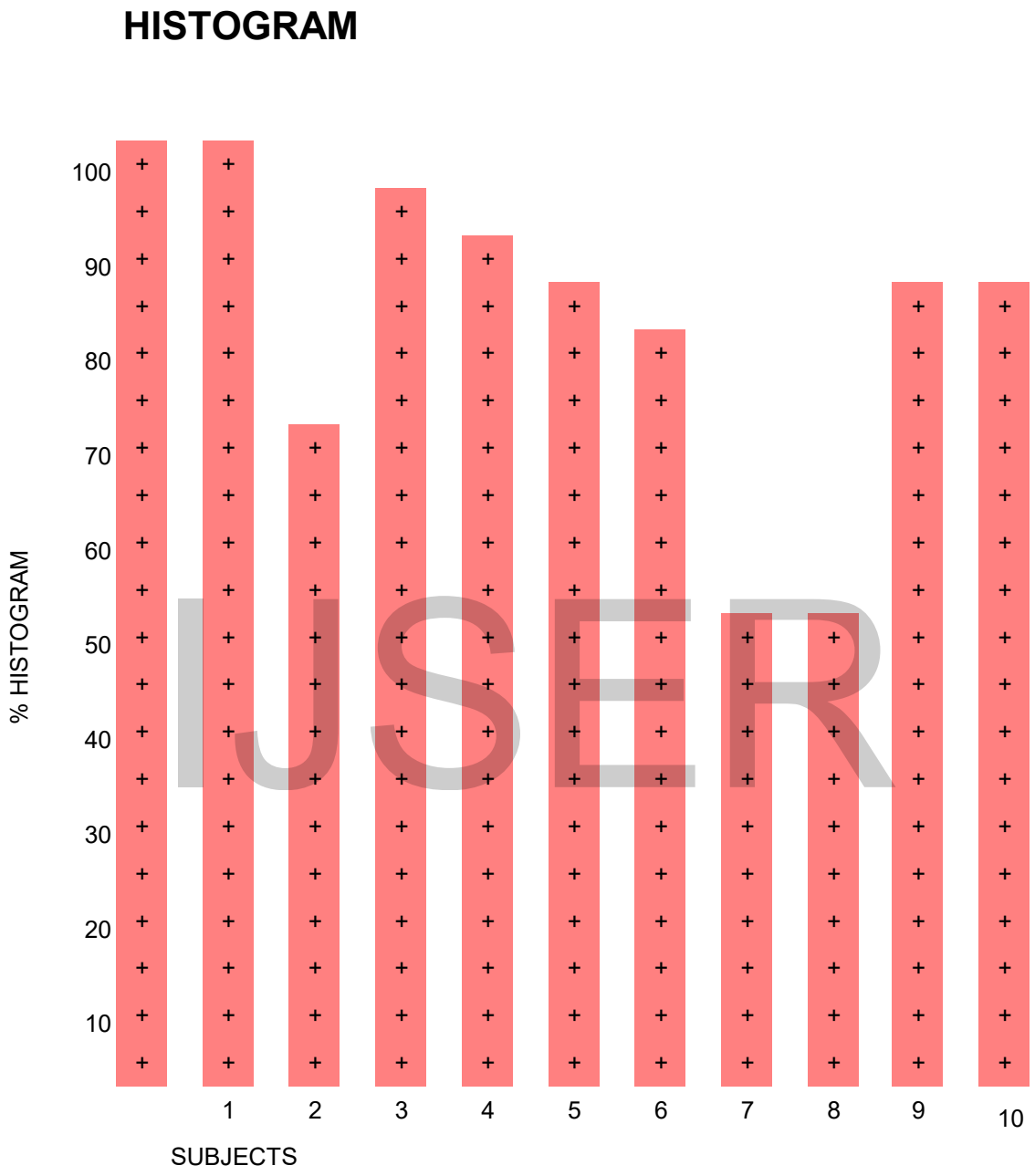
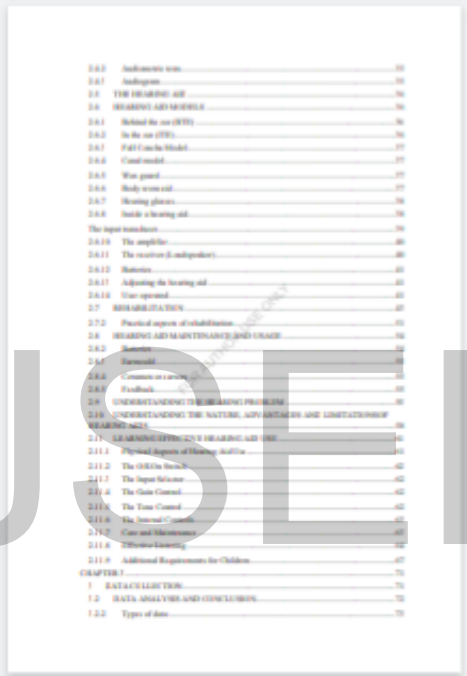
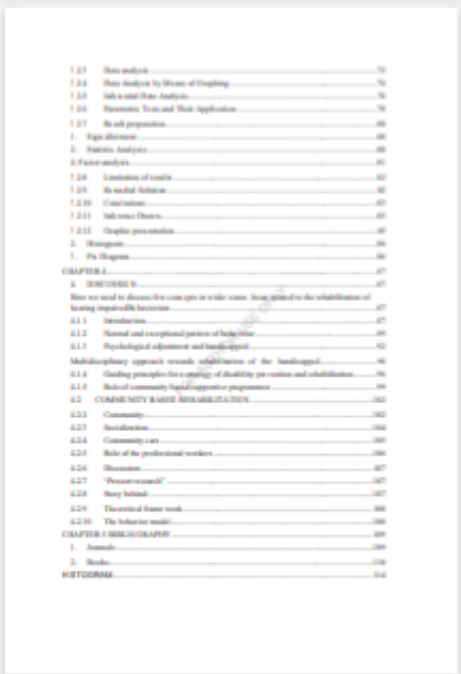
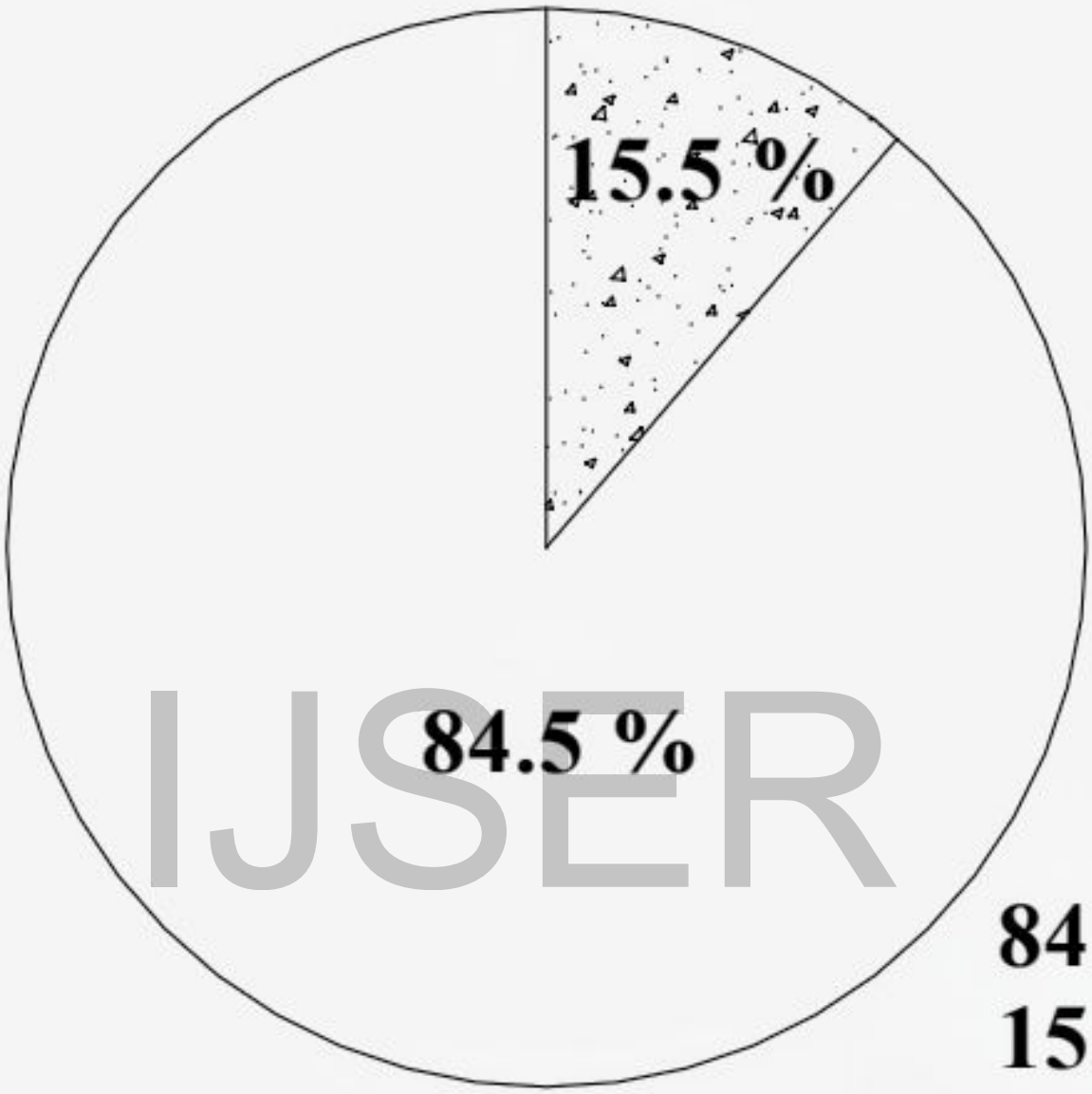

HISTOGRAM
% HISTOGRAM
100
90
80
70
60
50
40
30
20
10
1
2
3
4
5
6
7
8
9
10
SUBJECTS

QUESTIONAIRE

SR. NO.	QUESTIONS	ANSWER
QUESTION 1	DO YOU WEAR AND ADJUST HEARING AID ACCORDING TO YOUR NEED?	YES /NO
QUESTION 2	DO YOU CLEAN THE HEARING AID YOURSELF?	YES /NO
QUESTION 3	DO YOU DO MINOR JOBS RELATED WITH HEARING AIDS EG CHANGING BETTERY?	YES /NO
QUESTION NO 4	DO YOU FEEL THAT AFTER WAERING AID YOU FEEL COMPORTABLE AND BETTER THAN BEFORE?	YES /NO
QUESTION NO 5	DO HEARING AIDS HELP IN WACHING TV AND DOING HOUSE HOLDS JOBS?	YES /NO
QUESTION NO 6	DO YOU WEAR HEARING AIDS WHOLEDAY AND REMOVE IT ONLY BEFORE GOING TO BED?	YES /NO
QUESTION NO 7	DO YOU AVOID HERING AID DUE TO COSMATIC REASON EG IT LOOKS ODD WEARIN HEARING AIDS IN PARTY?	YES/ NO
QUESTION 8	DO YOU NEED TO ADJUST HEARING AIDS WHOLE DAY LONG/	YES / NO
QUESTION 9	DO YOU REMOVE HEARING AIDS AT NIGHT TIME AND WEARIT ONLY DAY TIME?	YES / NO
QUESTION 10	DO HEARING AIDS ARE EASSILY AVILABLE AND YOU GET ITS ASSESSORY EASILY AS WELL?	YES / NO







Pie Diagram