

THE ELDERLY HEARING AID USER
A SURVEY REPORT

Registration No. 8604

Maya P.N

An Independent project submitted as part fulfilment for
First year Master of Science (Speech and Hearing)
to the University of Mysore.

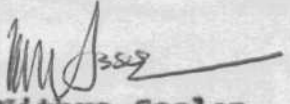
AllIndia Institute of Speech & Hearing
MYSORE-570 006.

MAY-1987

TO MY BELOVED
PARENTS AND TEACHER

CERTIFICATE

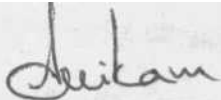
This is to certify that the Independent Project entitled: The Elderly Hearing Aid User - A Survey Report is the bonafide work in part fulfilment for the Degree of Master of Science (Speech and Hearing) of the student with Register No.8604.



Dr.M.Nithya Seelan
Director,
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CERTIFICATE

This is to certify that this
Independent Project Entitled: The Elderly
Hearing Aid User - A Survey Report has
been prepared under my supervision and
guidance.



DR. (Miss) S. Nikam,
Prof. & Head,
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DECLARATION

I hereby declare that this Independent Project Entitled: THE ELDERLY HEARING AID USER- A SURVEY REPORT is the result of my own study under the guidance of Dr.(Miss)S. Nikam, Prof. and Head, Department of Audiology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at my University for any other Diploma or Degree.

Mysore.

Register No.8604

May 1987.

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INTRODUCTION

With advancing age, most adults begin to lose some sensitivity to hearing. The process is so slow that the affected individual is not aware of the problem until his attention is drawn to it by friends and family members.

Hearing loss adds one more problem to the multitude of the problems that beset the elderly. The hearing loss is generally bilateral and symmetrical. It is predominantly of the sensori-neural type.

The pure tone audiogram does not give the true picture of the auditory problems of the aged. Of greater significance is the discrimination problem which is disproportionately high. This phenomenon was called "phonemic regression" by Gaeth(1948) and it is encountered frequently in the aged.

The most common causal factor of hearing loss in the aged is presbycusis. Other conditions associated with hearing loss in the elderly are: vascular accidents, Meniere's syndrome, noise exposure, ear infection, wax obstruction and otosclerosis.

Hearing loss attributed to the aging process is not amenable to medical or surgical treatment. To help ameliorate the problem, the need is felt for the establishment of aural rehabilitation programs. selection of an appropriate hearing

aid constitutes the first step in such a program. Many patients with a hearing loss due to presbycusis can be significantly helped with hearing aids.

Hearing aid fitting for the geriatric group must take into consideration their unique problems. Arthritis or crippled fingers and hands may cause difficulty in inserting an earmold, in adjusting the controls, in placing the cell etc. With increasing miniaturization of hearing aids and the controls, this problem assumes much significance. Other problems include visual problems, organic brain syndromes and motor difficulties.

No battery of tests have been devised to predict success in the use of a hearing aids User acceptability is the ultimate test.

A number of factors contribute to the successful adjustment to a hearing aid. An important consideration is motivation. If the user is not motivated to change his states with respect to his aural performance it is unlikely that the hearing aid will be used. Second, there is a wide range of auditory capacities in the hearing impaired. The correlation between pure tone threshold and auditory capacity is not perfect. Third, patients are not equal in their ability to learn to use an hearing aid. Some will have to return as often as necessary for re-training and also for more counselling. It is also recommended that loaner instruments be made available to enable the geriatric hearing aid user to adjust to amplification prior to purchasing his/her own instrument.

After the hearing aid is procured, the audiologist is faced with the most difficult challenge. In spite of counselling, the aid may not be fully accepted. Diminished ability for speech discrimination is not accepted as a limitation of the human hearing mechanism, but as a fault of the hearing aid. More personalized services are expected when hearing aids are procured on payment. This may mean more follow-up so that the audiologist may survive in 'market place'. If services that are acceptable are not delivered, he runs the risk of losing his clients. Hence the audiologist must know the characteristics, and needs of the clientele who are served by him/her.

Need for the study:

There is a need for a study of the geriatric hearing aid user for the following reasons:

First, there is an increase in the number of older people. Out of a world population of 4,500 million in 1982, about 600 million were over 60. In addition, the relationship of different age-groups to each other is changing. Whereas earlier for every individual over the age of 75, there were 25 individuals, today for each 75-year old there are only 15 younger people. Hence, any study related to the older citizen is highly relevant.

Second, very few studies have been done regarding hearing aid usage and adjustment by the aged. It is important to identify factors that contribute to success and adjustment with the hearing aid. It is recognized that amplification does benefit the

aged, but the measurement tools need to be refined. For this purpose it is necessary to have input from the hearing aid user were periodically.

Third, it is necessary to identify a group for whom use of hearing aid is not the acceptable answer so that other ways of giving help may be considered.

Fourth, factors such as life time patterns of living and geographical distribution may play a role in adjustment to amplification.

Fifth, decline in hearing is shown to follow different patterns in different cultures. This would have a bearing on the aural rehabilitation programs of which hearing aid usage forms an integral part.

The present study is intended to provide information regarding several aspects of hearing aid usage by the geriatric population under Indian conditions.

METHOD

The purpose of the present survey was to find out some characteristics of the hearing aid users above the above of 40 years.

Subjects:

Fiftyseven hearing aid users - 43 males and 14 females - ranging from 44 years to 93 years of age served as the subjects for this study. The mean age of the subjects was 65.5 years. The median age was 65 years.

Some of the subjects out of fiftyseven, voluntarily attended a camp which was arranged for the purpose of collecting the information. The rest were those who visited a speech and hearing center.

Questionnaire:

The questionnaire which was used in this study consisted of five parts (Appendix-A). A brief explanation of each part is as follows:-

(1) General information: This part contained general information about the case such as age, sex, education, etc.

(2) Audiologic and medical history: Information regarding hearing loss and other related problems were included in this section.

(3) Information about the hearing aid use: care and maintenance: This section yielded information about the knowledge the user had about the hearing aid.

(4) Adjustment to the hearing aid: Here, information regarding his/her performance with and without the hearing aid was collected.

(5) Attitude towards the aid: This part contained questions about the person's attitude towards the hearing aid.

The questions were selected from (1) the questionnaires used by Kamalini (1985); (2) the Hearing Handicap scale (High. Fairbanks and Glorig, (1964); (3) FSPHAU (Feasibility scale for Predicting Hearing Aid User) by Rapp, Higgins and Usurer (1977).

Procedure:

A combined approach of questionnaire and interview was adopted. All the subjects were interviewed by audiologists and speech pathologists, who were familiar with the questionnaire as well as with the three point scale (++, +, -) which was used for rating. Thus, it was ensured that the appropriate answer was elicited for every question.

The responses were recorded manually.

Results:

The responses were scored and converted to percentages and is discussed in the following section.

RESULTS

The results obtained are presented in tables and graphically where appropriate.

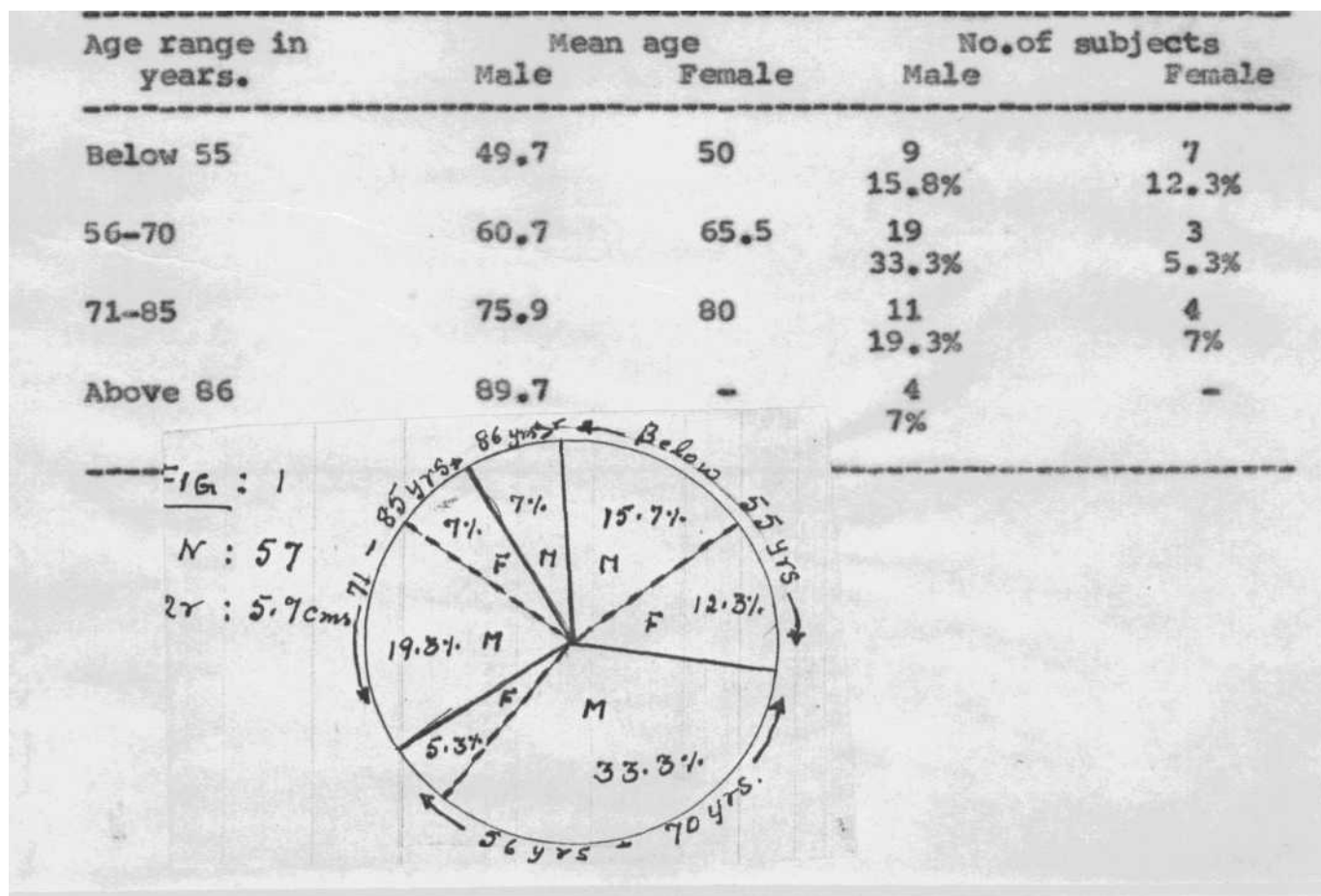
I. General information:

Age and Sex distribution - Table-1 shows age range of the subjects and their mean age. It can be seen that the majority of the subjects were in the age group of 56-70 years. Those below 55 years and those between 71-85 years were represented equally.

Table-1 also shows that there were greater number of males in each of the age groups, the is maximum number being in the age group 56-70 years. The above is shown also in Fig.1. There were no females above 86 years eventhough there were 4 males in this group. The maximum number of females were in the age group of below 55 years.

Table-1

Distribution of subjects according to Age Group

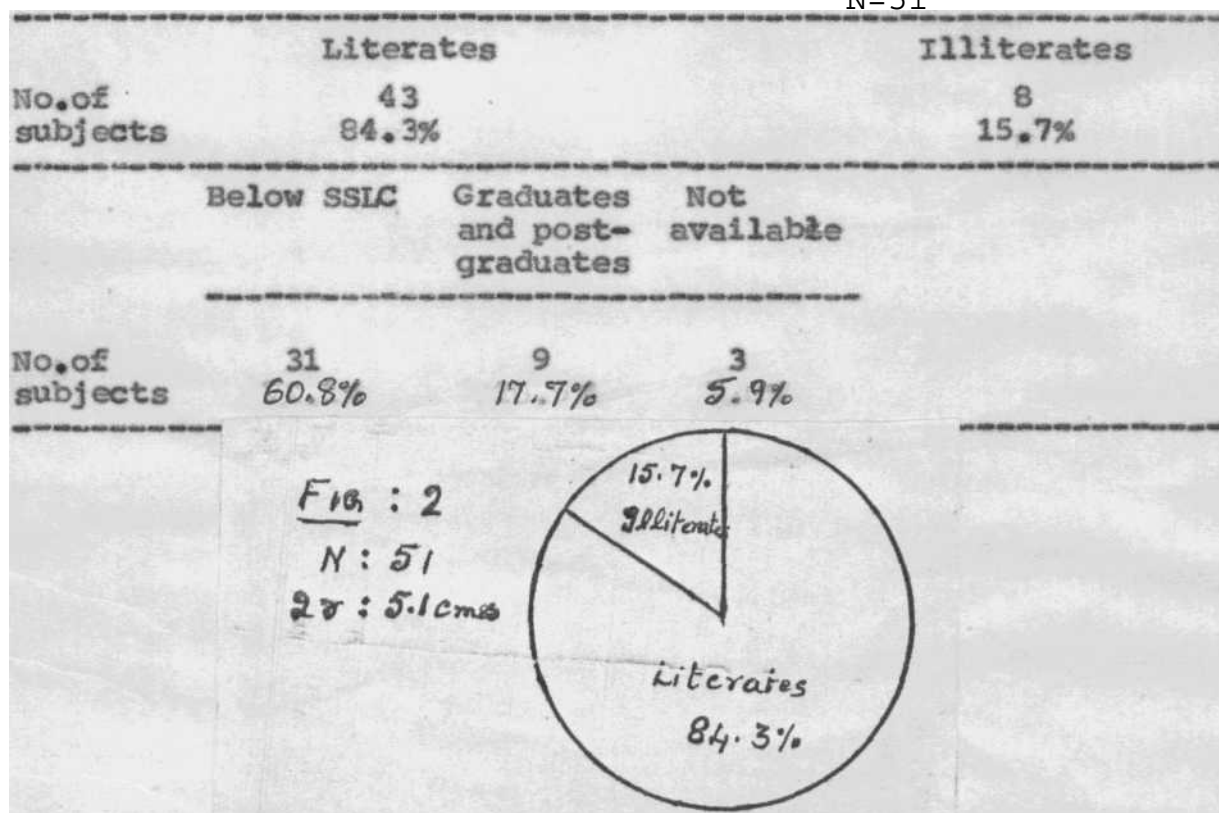


Literate and Illiterates - Table-2 shows the distribution of subjects according to their status of literacy. It can be seen that the majority of subjects were literate. Of this group those with an educational status of below SSLC were maximum. These with graduate and post-graduate degree numbered only 9. The educational status for 3 were not available. The illiterates were only 8 constituting 15.7 percent of the total number. This is also shown in Fig.2:

Table-2

-----Distribution according to status of Literary and --
Education

N=51



Employment - In table-3, distribution of subjects in the employed and unemployed category is shown. Those in the unemployed category slightly cut number those in the employed category. In the

unemployed category the retired group constitutes the majority. Next came the housewives.

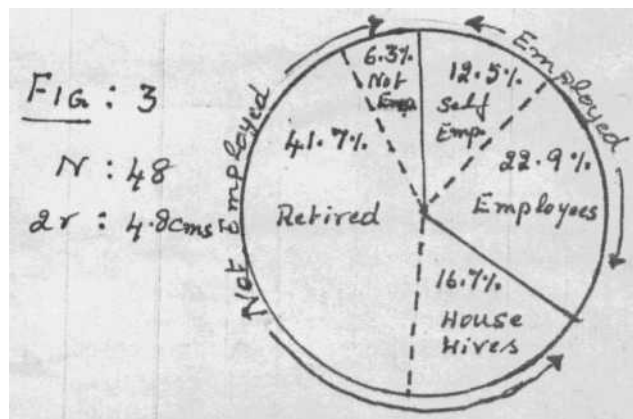
Among the employed, the self-employed is a slightly smaller number compared to the employees. Fig. depicts the same.

Table-3

Subjects in relation to employment

N=48

| | Employed | | Unemployed | | |
|----------------|------------|-------------|------------|-------------|-------------|
| | Self | Employees | Housewives | Retired | Not employe |
| No.of subjects | 6 12.5% | 11 22.9% | 3 16.7% | 20 41.7% | 3 6.3% |

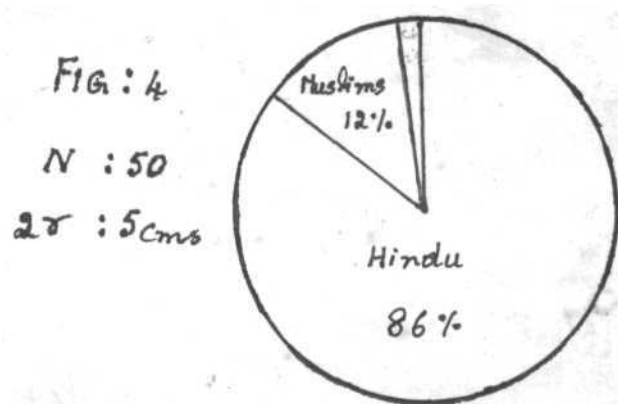


Religion - In table-4 it can be seen that an overwhelming majority of the subjects were Hindus, with the Muslims coming a distant second. There was only one Christian subject. The same is depicted in Fig.4.

Table-4

Subjects according to religion N = 50

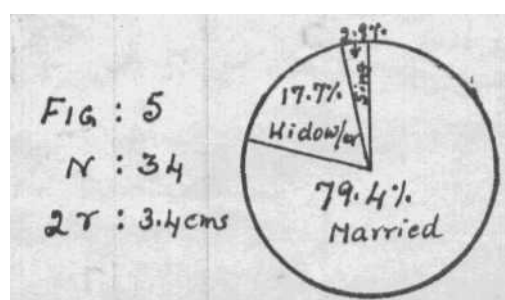
| | Hindu | Muslim | Christian |
|----------------|-----------|----------|-----------|
| No.of subjects | 43 86% | 6 12% | 1 2% |



Marital status - Table-5 shows that a significantly higher number of subjects were married whose spouses were alive. There was only one unmarried subject in the group. The same is shown in Fig.5.

Table-5
Subjects according to marital status

| | Married | widower/widow | Single |
|----------------|-------------|---------------|-----------|
| No.of subjects | 27 79.4% | 6 17.7% | 1 2.9% |

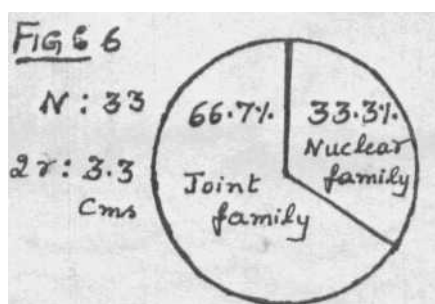


Family Constellation - It can be seen in Table-6 and in Fig.6 that twice as many of the subjects came from joint families as did those from nuclear families.

Table-6
Family Constellation

N = 33

| | Joint family | Nuclear Family |
|-----------------|--------------|----------------|
| No. of subjects | 22 66.7% | 11 33.3% |

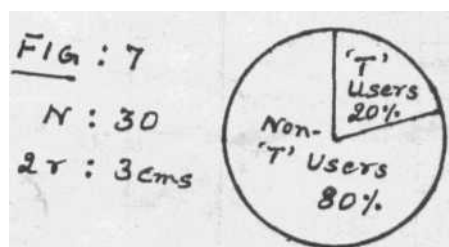


Telephone users - Table-7 shows that a significantly higher number of the subjects were non-telephone users. Only 20% of the subjects used the telephone (Fig-7)

Table-7
Telephone Users

N = 39

| | Telephone users | Non-telephone users |
|-----------------|-----------------|---------------------|
| Ho. of subjects | 6 20% | 24 80% |

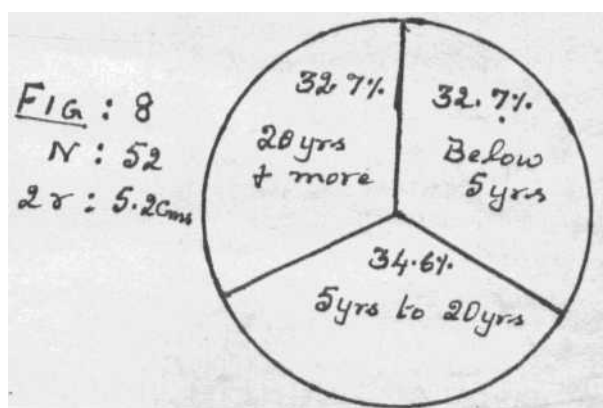


II. Audiologic and medical history:

Age at which hearing loss was noted - Table-8 shows that there was no difference among the subjects as to When the hearing loss was noticed. The number is almost equally distributed among the three categories: duration of less than 5 years, between 5 to 20 years and 20 years or more. (Fig.8)

Table-8
Age at which hearing loss noticed
N = 52

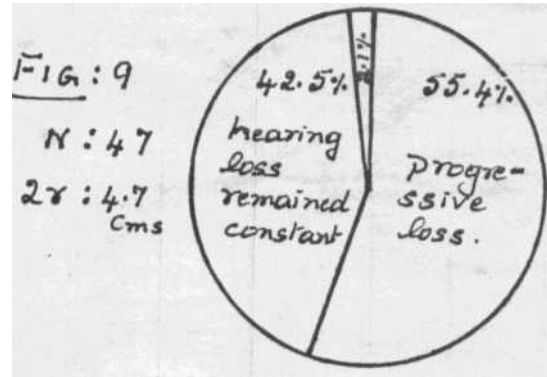
| | Below 5 years | 5 to 20 years | 20 years or more |
|----------------|---------------|---------------|------------------|
| No.of subjects | 17 32.1% | 34.6% | 17 32.7% |



Nature of loss - In table-9 the number with progressive loss is found to be higher than the number with non-progressive loss coming a close second. Only one subject was found whose hearing had improved.

Table-P
Nature of Loss
N * 47

| | Progressive loss | Loss remained constant | Became better |
|----------------|------------------|------------------------|---------------|
| No.of subjects | 26 55.4% | 20 42.5% | 1 2.1% |

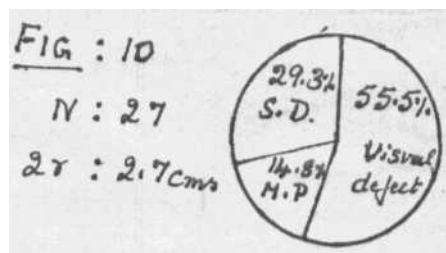


Associated problems - Visual defects, motor problems and systemic diseases were found in varying frequencies. Of these, visual defects predominated over the others. The problem was seen more in 56-70 years group and 71-65 being the next. The other two groups contained very few subjects. Motor problems were reported with least frequency. This is found in the older age groups and none in the age groups below 70 years, systemic disease occurs in all the 4 age groups.

In some patients more than one problem is found. These are shown in table-10 and fig.10.

Table-10
Subjects with other problems
according to age N = 27

| | Visual defects | Motor problem | Systemic diseases |
|--------------------|----------------|---------------|-------------------|
| Below 55 years | 1 3.7% | - | 2 7.4% |
| 56 - 70 years | 7 25.9% | | 2 7.4% |
| 71 - 85 years | 5 18.5% | 2 7.4% | 3 11.1% |
| 86 years and above | 2 7.4% | 2 7.4% | 1 3.7% |



III. General information about the hearing aid:

Type of Aid - Forty-nine subjects used body level hearing aids. Those using B-T-E's numbered 3. These are shown in Table-11. Whereas forty three procured their hearing aids free of cost, 9 paid for their instruments. All the subjects wore monaural aid. Some subjects wore the aid alternately between the two years.

Table-11
Type and means of procurement of hearing aid
N = 52

| | Body Level | | BTE |
|-----------------|-------------|------------|-----------|
| | Free | Payment | |
| No. of subjects | 43 82.7% | 6 11.5% | 3 5.6% |

The body type hearing aids could be classified into categories according to their gain. Table-12 shows that moderate gain hearing aids formed the major group whereas the other two groups had almost equal number.

Table-12
Hearing aids categorized according to gain
N=47

| | Categories | | |
|---------------------|-------------|-------------|------------|
| | Mild | Moderate | Strong |
| No. of bearing aids | 11 23.4% | 27 57.4% | 9 19.1% |

Condition of the hearing aid:

Table-13 shows that a significantly higher number of hearing aids were in 'good' (+) condition, Sixteen (35.6%) hearing aids were in 'very good*' (++) condition and only three (6.6%) aids were in 'bad*' condition. It can also be seen that eight aids in the '++' group were older than 2 years and most of the aids in good condition were not more than 2 years old.

Table-13
Condition of the aid in relation to period of use
N = 45

| SI. No. | Condition | Period of use | | | |
|---------|-----------|---------------|------------------|---------------------|---------------|
| | | 0-6 months | 6months-2 years. | 2 years and greater | Not available |
| 1. | ++ | 4 8.9% | 4 8.9% | 8 17.8% | - |
| 2. | + | 7 15.6% | 12 26.7% | 5 11.1% | 2 4.4% |
| 3. | - | | 1 2.2% | 2 4.4% | - |

Hearing aid placement - In Table-14 it can be seen that a greater number of subjects placed their hearing aids either in a pocket inside the shirt or blouse. Of them majority were below 70 years and had an educational status below SSLC. Those Who placed their aids in their front pocket or behind the ear without covering with a thick tuft of hair formed a minor group (++) . Their distribution according to age and educational status can be seen in the Table. Eleven (22%) of them placed their hearing aid

inside their vests or a thick coat, or in a box within a pocket (-).

Table-14

Hearing aid placement its relation to age, educational status

N = 50

| Place | Age group | | | | Educational Status | | | |
|-------|----------------|-----------|----------|--------------|--------------------|-----------|-------------------------|---------------------------|
| | Below 55 years | 56-70 | 71-80 | 86 and above | Nil | Upto SSLC | Upto graduate and above | Information not available |
| ++ | 2 4% | 5 10% | 3 6% | - | 3 6% | 3 6% | 4 8% | - |
| + | 9 18% | 11 22% | 8 16% | 1 2% | 2 4% | 16 32% | 2 4% | 9 18% |
| | 3 3% | 4 8% | 2 4% | 2 4% | 1 2% | 7 14% | 2 4% | 3 6% |

Checking the aid - Table-15 shows that fifteen (39.5%) subjects checked their aids by only listening through the aid (+). A greater number of these subjects were below 70 years and had an educational status below SSLC. Thirteen (34.2%) did not check their aids at all. Their distribution according to age and educational status is shown in the table. Ten (26.3%) subjects checked their hearing aids both by listening to the squeal and by listening through the aid.

Manipulation of controls: - Those who knew the operation and manipulated all the controls came under '++' group. Those who managed to manipulate the switches formed the '+&' group, which was the largest group. Table-17 shows the distribution of these subjects according to educational status and other problems. None of them had motor problems. Those with systemic diseases were distributed equally between the groups.

Table-17

Manipulation of controls in relation to education and other problems N=46

| Manipulation | Educational status | | | | Other problems | | | |
|--------------|--------------------|-------------|----------------------|---------------|----------------|-------|------------------|-------------|
| | NIL | Upto SSLC | Upto Grdn. and above | Mot available | Visual | Motor | systemic disease | NIL |
| ++ | - | 7 15.2% | 3 6.5% | 4 3.7% | 5 10.9% | - | 3 6.5% | 6 13.05% |
| + | 2 4.3% | 16 34.8% | 5 10.9% | 9 19.5% | 6 13.05% | 6.5% | 3 | 23 50% |
| | - | - | - | - | - | - | - | - |

Usual setting of controls - As indicated in Table-18 the largest category (++) consisted of individuals who kept their volume control at one-third of maximum, amounting for 65.2% of the entire group. There were thirteen (29.7%) subjects who kept their volume control at either one-fourth or one-half(+). Only three (6.5%) formed a group (-) who kept their aid at 'barely on' or in 'full on' position.

Table-18
Usual setting of controls

N=46

| Category | No. of subjects | Percentage of subjects |
|----------|-----------------|------------------------|
| ++ | 30 | 65.2% |
| + | 13 | 28.3% |
| - | 3 | 6.5% |

V. Spare parts:

Type of cell used - Table-19 shows that a greater number of subjects specified the make of the cell they normally used. Others used any available pentorch cell. Among the subjects only one subject used a rechargeable pentorch cell.

Of the three BTE users only one reported the use of rechargeable cell.

Table-19
Type of cell used

N = 38

| | Pentorch | | Recharg- eable. | Button | |
|-------------------|-------------|---------------|--------------------|--------------|---------------------|
| | Any cell | Brand name | | Rechargeable | Non-chargea- ble |
| Now Sub- jects | 14 36.9% | 23 60.5% | 1 2.6% | 1 | - |

Insertion of the Cell - Table-20 shows the number of subjects who were able to insert the cell without any problem (++) and those who managed to insert the battery formed (+) group and

those who were not able to insert the cell (-). There was only one subject in the last category who had no associated problems.

A majority of the subjects who inserted the cell without any problem fell in the first two age groups. In the '+' category, the age group above 86 years contained none. Table-20 also shows a preponderant number of literatus. A majority of the subjects inspite visual problem had no difficulty in inserting the cell.

Table-20
Insertion of cell N=43

| Cate gory | Age group | | | | Literacy | | | Associated problems | | | |
|--------------|----------------------|----------------|----------------|----------------------|-------------|-----------|-----------|---------------------|-----------|-----------|-------------|
| | Below 55 Years | 56-70 years | 71-85 years | Above 86 years | Lit | Illit | NA | vis. | Motor | SD | Nil |
| 4+ | 5 11.6% | 8 18.6% | 5 11.6% | 1 2.3" | 15 34.9% | 2 4.7% | 2 4.7% | 7 16.3% | 1 2.3% | 3 7.0% | 8 18.6% |
| + | 8 18.6% | 10 23.6% | 6 14.0% | - | 17 39.5% | 4 9.3% | 3 7.0% | 1 2.3% | - | 2 4.7% | 21 48.8% |
| - | - | - | 1 2.3% | - | - | - | 1 2.3% | - | - | - | 1 2.3% |

Checking the cell - Table-21 shows the number of subjects who checked/didnot cheek the voltage of the cell with respect to their educational level. The subjects seem to be distributed almost equally into three categories, i.e. checking the voltage of the cell either by using an instrument or by listening to the squeal (++) , hearing through the aid (+), who did not check.(-)

Table-21

Checking the cell with respect to educational status.

N=47

| Educational status | Checking the call | | |
|--------------------------------------------|-------------------|-------------|------------|
| | ++ | + | - |
| Nil | 2 4.5% | - | 2 4.6% |
| Upto SSLC | 9 19.1% | 10 21.3% | 6 12.8% |
| Upto graduation and Post- graduation | 3 4.6% | 1 2.1% | 4 8.5% |
| Not Reported | 3 6.4% | 5 10.6% | 3 6.4% |

Frequency of changing the cell - As presented in Table-22, a majority of the subjects changed their cell once in 15 days to one month (39.4%). Of them 15.8% used the aid for more than 8 hours per day. A large number of subjects also changed their cells after an elapse of more than one month. Most of those who used the aid for more than 8 hours per day, changed their cells within 15 days.

Table-22

Frequency of changing the cell in relation to duration of use in
* day. N = 38

| Frequency of changing the cell | No. of hours | | | |
|-----------------------------------|--------------|------------|------------|------------|
| | 2-4 | 4-8 | 8 - 12 | Above 12 |
| Upto 15 days | 1 2.6% | - | 3 7.9% | 4 10.5% |
| 15 days - 1 month | 4 10.5% | 5 13.1% | 6 15.8% | - |
| 1 month - and above | 10 26.3% | 1 2.6% | 3 7.9% | - |

The subjects' criteria to change the cell could be broadly categorized into three categories. The largest category (71.4%) are those who changed when the cell was weak. 23.8% changed when there was too much of noise from the aid. Only one subject changed when he could not hear through the aid. This is depicted in Table-23.

Table-23
(Criteria to change the Battery N = 21)

| | Weak battery | Noise from the aid | Does not hear |
|------------------|--------------|--------------------|---------------|
| No. of Sub-jects | 15 71.4% | 5 23.6% | 1 4.8% |

Condition of the cord - Table-24 shows that a significantly higher number of cords were in 'good' (+) condition. Thirteen (30.9%) of the cords were in very good (++) condition and only 5 (11.9%) were found in bad condition(-).

Table-24
Condition of Cord N = 42

| | Condition of Cord | | |
|-----------------|-------------------|-------------|------------|
| | 4+ | + | - |
| No. of subjects | 13 30.9% | 24 57.1% | 5 11.9% |

Checking method - In table-25 it can be seen that about one-half of the subjects did not check the cord (-). A large number of subjects in this category fall in the group below SSLC and no other problems. Approximately one-third checked by listening (+) and

the remaining checked the cord using the correct method.

Table-25

Checking method in relation to educational and other problems

N = 39

| Checking method | Educational status | | | | Other problem | | | |
|-----------------|--------------------|------------|----------------------|----------------|---------------|-----------|-------------------|-------------|
| | NIL | Upto SSLC | Upto grdn. and above | Not available. | Visual | Motor | systemic Diseases | NIL |
| ++ | - | 3 7.7% | 1 2.6% | 2 5.1% | 1 2.6% | - | - | 5 12.8% |
| + | 1 2.6% | 8 20.5% | - | 3 7.7% | 2 5.1% | - | - | 10 25.6% |
| - | 2 5.1% | 8 20.5% | 6 15.4% | 5 12.8% | 6 15.4% | 1 2.6% | 4 10.3% | 10 25.6% |

Frequency of changing the cord - The majority of subjects replaced their cords once within 6 months. Fewer number Changed their cords between one to two years. A small number of subjects changed one* within one year and after two years (Table-26)

Table-26

Frequency of changing cord

| | within 6 months | 6 months- one year | one - two years | More than two years |
|-----------------|-----------------|--------------------|-----------------|---------------------|
| No. of Subjects | 6 37.5% | 3 18.6% | 5 31.3% | 2 12.5% |

Condition of the earmold/ear tip: - In Table-27, it can be seen that the molds found in 'good' (+) condition out numbered the molds in 'verygood' condition which in turn out numbered the 'dirty' molds.

Table-27
Condition of the Earmold/Eartip

| N = 48 | | | |
|-----------------|---------------------------------|-------------|------------|
| | Condition of the Earmold/Eartip | | |
| | ++ | + | - |
| No. of subjects | 15 31.3% | 23 52.1% | 8 16.6% |

Insertion of the earmold/eartip - Table-28 shows that except two (-) all other subjects were able to insert the mold themselves. Of these a comparatively smaller number of subjects were able to insert the mold without any difficulty(++), out of age group 56-70 years contained more number of subjects. Seven (15.2%) of them also exhibited visual problem and two had systemic diseases. The distribute of subjects who managed to insert the earmold with respect to their age and other problems associated, are shown in table-28.

Table-28
Insertion procedure with reference to age and other problems
N = 46

| Insertion | Age group | | | | Other problems | | | |
|-----------|----------------|-------------|-------------|-----------|----------------|-----------|------------------|---------------|
| | Below 55 years | 56-70 Years | 71-85 Years | 86 years | Visual | Motor | systemic disease | Not available |
| ++ | 8 17.4% | 9 19.6% | 4 8.7% | 1 2.2% | 7 15.2% | | 2 4.4% | 13 28.3% |
| + | 6 13.0% | 9 19.6% | 8 17.4% | 1 2.2% | 5 10.9% | 1 2.2% | 2 4.4% | 16 34.8% |
| - | - | 1 2.2% | 1 2.2% | | - | | 1 2.2% | 1 2.2% |

Problems with the earmold/eartip - Five subjects reported that they experienced difficulty with their molds. In three subjects, the difficulty was due to loose molds, in one subject it was due to the sharp edges of the mold. One subject reported that the receiver did not fit properly to the mold.

VI Repairs of the hearing aid:

Only seven subjects had their aids repaired. Of seven, six had their aids repaired free of cost. One had his hearing aid repaired by a dealer on payment.

Four hearing aid users met the repair expenditure themselves and in case of two, it was met by others.

All the seven had their hearing aid repaired only once.

VII. Recurring Expenditure:

Half yearly expenditure of the cell - Table-29 shows that the highest number of subjects spent about Rs.20/- or less for 6 months, and equal number of subjects spent between Rs. 21/- to Rs.40/- and Rs.41 and greater.

Table-29
Half yearly expenditure of the cell

N = 19

| Amount | Half yearly expenditure of the cell | | |
|-----------------|-------------------------------------|-----------------|-----------------|
| | Rs. 0 to 20 | RS. 21 to 40 | Rs. Above 41 |
| No. of subjects | 12 63.2% | 3 15.8% | 3 15.8% |

Half-yearly expenditure of the cord - Table-30 shows that an overwhelming number of subjects did not spend money on cords. An equal number of subjects spent between Rs.6/- and Rs.12/-, and between Rs.13/- and Rs.24/- in 6 months. Two (8%) subjects reported spending less than Rs.6/- in 6 months.

Table-30
Half yearly expenditure of the cord N = 25

| Half yearly expenditure of the cord | | | | |
|-------------------------------------|-------------|-----------|------------|-----------|
| Amount | Upto Rs.6/- | Rs.6 - 12 | Rs.13 - 24 | Nil |
| No. of subjects | 2 8% | 4 16% | 4 16% | 15 60% |

Half yearly expenditure for repair - Only one subject had spent about Rs.30/- for repairs on the hearing aid.

Hearing aid care - It was found that except for two subjects, all others took care of their hearing aid themselves.

VIII. Adjustment to the aid:

Duration of daily use of the hearing aid - It was found that most of the employees used the aid for greater than 8 hours per day. Subjects with self employment of duration of use per day. A significantly greater number of subjects who were not employed used the aid for a minimum number of hours (Table-31).

Table-31
Duration of the use of the hearing aid N = 39

| Employment | No. of hours per day | | | |
|---------------|----------------------|------------|------------|--------------|
| | 0 - 4 | 4 - 8 | 8 - 12 | 12 and above |
| Employees | | 2 5.1% | 5 12.8% | 1 2.6% |
| Self employed | 2 5.1% | 2 5.1% | 2 5.1% | |
| Not employed | 14 35.9% | 4 10.6% | 6 15.4% | 1 2.6% |

Duration of use in relation to marital status - Table-32 shows that a majority of the married subjects with their spouses alive used the aid for a longer duration.

Table-32
Duration of use in relation to marital status
N = 18

| Marital status | Ho.of hours per day | | | |
|----------------|---------------------|------------|------------|------------|
| | 0-4 | 4 - 8 | 8 - 12 | 12 & above |
| Married | 1 5.6% | 5 27.6% | 8 44.4% | 2 11.1% |
| Widow | - | - | 1 5.6% | - |
| Single | - | - | | |

Duration of use in relation to residential set up - Table-33 showed that a significantly greater number of subjects who lived in joint family used the aid for less than 4 hours per day. Whereas a majority of the subjects living in nuclear families used the aid for longer duration.

Table-33
Duration of uae in relation to residential set up
N = 27

| Residential | No.of hours per day | | | |
|----------------|---------------------|------------|------------|--------------|
| | 0 - 4 | 4 - 8 | 8 - 12 | 12 and above |
| Nuclear family | 2 7.4% | 2 7.4% | 4 14.8% | |
| Joint family | 9 33.2% | 3 11.1% | 6 22.2% | 3.7% |

Duration of use in relation to associated problems - In table-34, it can be seen that most of the subjects with tinnitus, vertigo and ear discharge used the aid for longer duration.

Table-34
Duration of use in relation to association problems

N = 22

| Problems | Number of hours per day | | | |
|----------|-------------------------|------------|------------|--------------|
| | 0 - 4 | 4 - 8 | 8 - 12 | 12 and above |
| Tinnitus | 4 18.2% | 5 22.7% | 6 27.3% | 2 9.1% |
| Vertigo | - | 1 4.5% | 2 9.1% | - |
| CSOM | - | - | 2 9.1% | - |

Period of use: - It can be seen from Table-35 that 17 (30.9%) subject, used the aid below months and approximately equal number of subjects used it for more than 2 years.

Table- 35
Period of use

N = 55

| Period | Period of use | | |
|----------|---------------|----------------|---------------|
| | 0-6months | 6months-2years | above 2 years |
| Subjects | 17 30.9% | 22 40% | 16 29.1% |

Hearing Environmental sounds: Table-36 shows that a large number of subjects heard warning signals like bus horn, siren, etc. in aided condition, whereas eight (19.5%) subjects heard these sounds in unaided condition, It can be seen that four (9.7%) subjects

did not hear the cycle bell even with the hearing aid. The Table-36 also shows the (number) percentage of subjects rated in three point scale under different conditions of hearing.

Table-35
Hearing environmental sounds N = 41

| Hearing environmental sounds | | | | | | | | | |
|------------------------------------------|------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| Condition | ++ | | + | | at - | | NR | | A |
| | UA | A | UA | A | UA | A | UA | A | |
| a)Warning signals (bus-horn, siren etc.) | 8 19.5% | 20 68.3% | 10 24.4% | 12 29.3% | 22 53.6% | | | 1 2.4% | 1 2.4% |
| b) Cycle bell | 5 12.2% | 22 53.6% | 22 17.1% | 13 31.7% | 22 65.8% | 4 9.7% | 2 4.8% | 2 4.8% | 2 4.8% |
| c) Dpor bell | 2 4.8% | 26 63.4% | 26 26.8% | 11 26.8% | 27 65.8% | 2 4.8% | 1 2.4% | 1 2.4% | 2 4.8% |
| d) Water running | 1 2.4% | 18 43.9% | 2 4.8% | 9 21.9% | 33 78% | 7 17.1% | 6 14.6% | 6 14.6% | 17 41.3% |
| e) Pressure cooker | 3 7.3% | 10 24.4% | 5 12.2% | 6 14.6% | 15 36.6% | 4 9.8% | 18 43.9% | 18 43.9% | 21 51.2% |
| f) Telephone ring | 1 2.4% | 5 12.2% | 2 4.9% | 3 7.3% | 8 19.5% | 3 7.3% | 30 73.2% | 30 73.2% | 30 73.2% |

++ = Hears always

+ = Hears sometimes

- = Does not hear

UA = Unaided

A = aided.

speech awareness: The number of subjects who are aware of different speech sounds are shown in Table-37. Eighteen(45%) of the subjects were able to hear their names when called from the next room, whereas

20% of the subjects were not able to hear the same even in the aided condition.

One-half of the subject could differentiate the voices of men and women. The number of subjects who were able to recognize the voices of family members and to hear the vegetable vendors' call is also shown in the table.

Table-37
Speech awareness

| Conditions | speech awareness | | | | | | | |
|------------------------------------------|------------------|-------------|------------|-------------|-------------|------------|------------|-----------|
| | ++ | | + | | - | | NR | |
| | UA | A | UA | A | UA | A | UA | A |
| a)Hears name when called from next room. | 1 2.5% | 18 45% | 5 12.5% | 13 32.5% | 53 82.5% | 8 20% | 1 2+5% | 1 2.5% |
| b)Recognise voices of family members. | 1 2.5% | 19 47.5% | 6 15% | 15 37.5% | 32 80% | 3 7.5% | 1 2.5% | 3 7.5% |
| e)Hears vegetable vendor | 2 5% | 14 35% | 4 10% | 17 42.5% | 30 75% | 5 12.5% | 4 10% | 4 10% |
| d)Differ-entiate voice* of men and women | 2 5% | 20 50% | 9 22.5% | 14 35% | 24 60% | 3 7.5% | 5 12.5% | 3 7.5% |

++ = Hears always; + = Hearing sometimes; - = Does not hear.

UA = Unaided; A = aided.

Speech Discrimination: It can be seen in the table-38 that 50% of subjects were able to understand speech when they had visual cues, in the aided condition. It can also be seen that, in aided condition relatively few subjects were able to understand speech even in the

presence of other sounds. Apparently, large number of subjects, even with the hearing on, found it difficult to understand the speech.

Table-38
Speech Discrimination

N = 40

| Condition | Speech discrimination | | | | | | | |
|--------------------------------------------|-----------------------|-------------|-----------------|-------------|-------------|-----------|-------------|------------|
| | UA ^{++h} | A | UA ⁺ | A | HA | A | UA | NR |
| Face to Pace | | | | | | | | |
| - At home | 4 10% | 20 50% | 12 30% | 7 17.5% | 13 32.5% | 1 2.5% | 11 27.5% | 12 30% |
| - At work 0 | | 13 32.5% | 5 12.5% | 8 20% | 17 42.5% | 1 2.5% | 17 42.5% | 18 45% |
| - At other places | - - | 9 22.5% | 8 20% | 4 10% | 10 25% | 3 7.5% | 22 55% | 24 60% |
| Cannot see the speaker | - | 13 32.5% | 4 10% | 15 37.5% | 30 75% | 6 15% | 6 15% | 5 12.5% |
| Understands TV | - | 7 17.5% | 5 12.5% | 5 12.5% | 17 42.5% | 6 15% | 22 55% | 22 55% |
| Understands Radio | 3 7.5% | 13 32.5% | 5 12.5% | 10 25% | 23 57.5% | 8 20% | 9 22.5% | 9 22.5% |
| Conversation with one person | - | 8 20% | 4 10% | 15 37.5% | 34 85% | 14 35% | 2 5% | 3 7.5% |
| Conversation with more than three persons. | - | 6 15% | 2 5% | 12 30% | 33 82.5% | 18 45% | 5 12.5% | 4 10% |
| Telephone conversation | - | 1 2.5% | 1 2.5% | 1 2.5% | 4 10% | 2 5% | 35 87.5% | 36 90% |

DISCUSSION

I. General Information:

Age: In the present survey the upper age limit was 93 years which indicates that the elderly population did not consider age as an hindrance in wearing prosthesis.

Sex: The fewer number of females ia the survey might be due to reasons such as social stigma, nonacceptance of their handicap, etc.

Literacy and Educational Level: There was a high literacy rate among the subjects of the present survey. This could be expected as the survey done was in a city.

But educational level of a majority was below SSLC(which correlates with the general education level of the whole population This may be attributed to the less reliance on formal education in earlier days.

Employment: It is natural to have more number of retired people ia this population as shown by this survey. The number of subjects in the employed category was less. Perhaps because they did not want to publicise their deficiency.

Family constellation: The number of joint families vs. nuclear families suggest that still joint families are more popular.

II. Audiological and Medical History:

Results of the present survey showed that a majority had progressive loss which is expected in presbycusis cases. (Schuknecht, 1974).

The subjects were also found to have other problems such as visual problems, motor problems and systemic diseases. In spite of these problems they participated in the follow-up programs. This depicts the amount of interest the subjects had in follow-ups.

Some subjects reported tinnitus, vertigo and ear discharge, Vanaja (1985) has extensively studied this population.

III. General Information about the Hearing Aids:

Body level hearing aids are the most widely used aids in India, though they are almost out of use in other countries (Ross, 1972; Kapteyn, 1977; Traynor, 1932; Hearing Aid Journal, 1977; Hearing Aid Journal, 1978). Reasons for this may be -

1. The low cost
2. Easy availability
3. Less recurring expenditure
4. Greater gain than other types of aids
5. Distribution of these aids under the Aids and Appliances Scheme
6. Involvement of visual and motor systems which makes it more difficult to manipulate the controls on the behind-the-ear aids.

The present survey also showed that most subjects used body level aids whereas only a few used behind-the-ear type (Manjula, 1986). Most of these were indigenously manufactured. In general it can be concluded that body type hearing aid users were more inclined to come for follow-ups than BTE users.

Of the body type hearing aid users only 8.5% had purchased their aids, and the rest had obtained it free of cost from the Aids and Appliances scheme.

This clearly indicates that there is a rapid increase in the number of elderly hearing aid users since the distribution of free aids under the Aids and Appliances Scheme.

From this data it can also be inferred that there are only a few economically well off elders using the hearing aid. This correlates with the poverty conditions in the Western countries. In U.S.A. it was found that one out of four senior citizens lived in poverty as compared to one out of nine younger persons (U.S -senate Committee on Aging, 1971). Schultz (1973) also reported that a high percentage of population living in conditions of near or actual poverty are the elderly.

Condition of the Aid:

Hodgson (1981) reported that for optimum performance of the hearing aid and its longevity, the hearing aid should be free from unnecessary exposure to dust, dirt, heat, humidity or other moisture.

The results of the present survey shows that most of the subjects had maintained the aid in a satisfactory condition. This may be because of the counselling procedures employed and also the interest of the users in their hearing aids. It is also possible that people might have cleaned their aids just before attending the follow-up program, as they liked to put forth their best appearance including their aids before the clinician. So it is necessary to have home visits,

Placement of the aid:

Placement of the hearing aid is considered to be an important factor in the discrimination of speech.

The present results showed that placement was not satisfactory in most of the subjects. This might be due to the social stigma about the aid or to hide their disability as far as possible, or poor cosmetic appeal of the aid, etc.

Checking the aid:

Daily monitoring (hearing aid check) is necessary to ensure adequate amplification (Hodgson, 1981). It was also recommended that the assistance of a normal hearing person be used to judge the quality and the presence of feedback whenever necessary. Checking the aid serves several purposes (Loavenbruck, Madell* 1981). (1) It allows them to resolve any difficulty quickly, without

unnecessary panic. (2) It avoids the need for unnecessary trips to the hearing aid dispenser to solve relatively simple problem.

Results in the present survey that listening through the aid was the method which most subjects employed. Further, it can be seen that those who used the more preferred method of checking the aid belonged to first two age groups. Education, however, seemed to have little relation with the method of checking the aid. This again can be attributed to the counselling procedure employed.

So, it can be concluded that the elderly hearing aid users are aware of maintenance of the aid.

IV. Switches/controls on the Hearing Aid:

Knowledge about the controls of their hearing aid is one of the factors that help in better utilization of hearing aid. A good hearing aid user must have complete knowledge about his hearing aid, its switches, controls, spare parts and their proper usage. For best listening he should know how to set the controls of the hearing aid (Hodgson, 1978).

Hearing aid users must learn the location and function of switches and controls on the aid, and to adjust them quickly and correctly. Manjula (1986) reported that only about one-fourth of BTE users identified the switches on their aids.

Results of the present survey showed that almost two-thirds of the subjects from whom the data could be collected identified some controls, whereas almost about one-third identified all the controls. It was also seen that age and educational level also seemed to play a role on this.

Neither education nor associated problems seems to have any relation to proper manipulation of controls. This again could be attributed to the counselling procedure. The associated problems might not have been such severe to affect the manipulation of controls.

The usual setting of the volume control is also an important factor in proper usage of hearing aids. Berger and Hagberg (1982) reported that most hearing aid users kept their volume control turned half way up.

In the present survey, it can be seen that a majority of the subjects kept their volume control turned up to one-third of the total range. Some other users usually kept their volume control either in a 'barely on' position or 'full on' position. The reasons for this may be (1) the deterioration of hearing aid after use, (2) the progressive loss.

V. Spare Parts of the Aid:

Information about spare parts is required by cases for seasons: (a) to know when any part needs to be changed, (b) how to use them, and (c) how to maintain them.

The cell: Knowing the type and make of the cell is necessary, as it was found that eventhough the type of the cell is same, there exists a slight difference in the sizes of the cells of different make. In the present survey most of the subjects reported the make of the cell. This indicated that most of them were aware of the type/make of the cell that they would have to use. This again can be attributed to good counselling procedure and also the user's desire in listening through the aid.

The hearing aid user should know the proper insertion of the cell into their aids (Maurer and Rupp, 1979). Hodgson (1972) recommends the teaching of the insertion procedure of the cell to the hearing aid users. In the present survey all but one person could insert the cell correctly. Majority of these subjects fell in the first two (44-55; 56-70 years) age groups and also in the literate group. But this may be because of the lesser number of subjects in the other age group and the illiterate group. Having additional problems such as visual defects, motor difficulties seemed to have no relation to the ability to place the cell accurately in the compartment. This probably is because most them used corrective lenses which reduced their visual handicap. The motor problem might not have been such severe to affect the insertion of the cell.

It was found in the present survey that almost one-third of the subjects did not know how to check the voltage of the

cell. It was also found that education did not play a role in this ability to check the cells voltage. This indicated that this group required additional counselling about the checking of voltage of the cell.

In the present survey, it was found that the frequency of changing the cell was related to the duration the aid was used daily.

The Cord: The reason for a few subjects who maintained the cord poorly and lacked in knowledge of checking the cord may be again attributed to counselling procedures.

Earmold/Ear tip: The earmold is not only a plastic plug made to fit a particular ear, but also is meant for sound conduction from the receiver to the ear canal(Lybarger, 1978). Wax clogged earmold is a common cause of nonfunctioning aid (Loavenbruck, Madell, 1981). so it is very essential to keep the molds clean. Again the importance of this should be stressed to the patient while counselling.

Though most of the molds were found to be clean, some dirty ones could be attributed to the lack of emphasis on the importance for cleaning the molds at the time of counselling. It is also possible that some of the elderly needed assistance in cleaning the earmolds which was not available to them.

Since the elderly people seemed to be knowledgeable about the spares indicated that they made regular use of hearing aid and did not end up on shelves.

VI. Repair of the aid:

Maurer and Rupp (1979) reports that the repair and servicing of the hearing aid must be expected only occasionally. It was found that only a few subjects had their aids repaired, in the present survey. This may be because most of the hearing aids had been in use for a relatively shorter periods.

VII. Recurring Expenditure:

Recurring expenditure is one of the factor in maintenance of the hearing aid. In the present survey majority of the elderly used the aid regularly as the results showed that half yearly expenditure on the cell was comparatively higher.

It also showed that their expenditure on cords was relatively high, for many subjects. This may be attributed to (1) poor maintenance (2) poor quality of the cord.

The hearing aid was looked after by majority of the elderly hearing aid users itself.

In general the hearing aid users felt the need to attend the follow-up program which is indicator of the interest of the elderly in obtaining as much benefit as possible.

VIII. Adjustment to the Hearing Aid:

Adjusting to the hearing aid is very essential for establishing hearing aid success, particularly with the elderly hearing

impaired population. Lazenby et al.(1986) recommended that it is worthwhile to explore the variables hindring this groups success with amplification. Berger et al.(1982)concluded that adjustment problems of hearing aid users can be examined by means of a questionnaire.

The indices to adjustment to the aid considered here are

- duration of use of aid in a day
- period of use of hearing aid
- hearing environmental sounds
- speech awareness
- speech discrimination.

-Duration of use of hearing aid in day:- Berger and Hagberg (1982) reported that majority of subjects used their hearing aid for more than eight hours.

the present survey also showed that many of the hearing aid users wore the aid for more than aight hours per day. But quite a large number of people used the aid for a minimum duration i.e. for less than four hours per day. This may depend on the persons communication needs. Wheeler (1986) reported that the lifestyle of the individual may influence the amplification utilization. The elderly person with other physical and mental restrictions, interacts only minimally with the environment and other people, has less needs than the elderly individual who engages in a variety of social activities with friends and/or family. Financial status is also a consideration.

A person's communication need can be generally judged indirectly from the occupational status, marital status, family constellation etc.

In the present survey it can be seen that majority of subjects who were appointed used the aid for definitely more than eight hours per day, self employed subjects (which includes agriculturists, businessman, etc) wore the aid for any amount of time that they wished to, as they could attend to their work better. Those subjects who came under the group of not employed such as retired people, housewives, showed that a number of them used the aid only for a shorter duration i.e. less than four hours.

Use for a longer duration was seen to a greater extent in the married group. This may be because more elderly people used their hearing aid to converse with their spouses.

Residential set up also was considered to influence the duration of hearing aid use (Castle, 1967). It was found earlier that usage of hearing aid was not affected whether they lived jointly or alone (Brooks, 1979). The results showed that more elderly people in joint families, used the aid for less number of hours, whereas more people living in nuclear families More the aid for greater number to hours. This may be because there were other family members to manage the house in joint families, while the hearing aid users themselves had to manage the house in nuclear families. The probability of

younger generation dominating is also possible. But one of the main reason for this might be due to higher noise levels in joint families.

- Period of use : - Period of use is also an important factor in adjusting to the amplification. It was seen that those who used the aid since a long time also attended the follow-up program. This shows their amount of interest in follow-ups.

- Hearing Environment Sounds; - speech Awareness; - Speech Discrimination:- The hearing aid success is considered to be low in the elderly population, due to a number of factors. It is considered that an elderly adult derives less benefit from a hearing aid than does a young adult with the same degree of hearing loss. This is attributed to aging in both the central as well as the peripheral system (Jerger, 1973; Konkle et al. 1977; Orchik and Burgers, 1977).

The results of the present study showed that though a majority of the subjects had adjusted to the aid, there were many who were not benefited by amplification. This is especially so in discrimination of speech in the presence of noise.

This may be due to reasons such as lack of motivation (Gaitz and Watshow, 1964; Borr, 1970; Rupp, Higgins and Maurer, 1977); psychological social and non-auditory physiological factors (Miller, 1967); decline in understanding speech due to aging (Peatalozza and shore, 1955; Harbert and young and Menduke, 1966)

Room acoustics is also important. It is suggested that reverberation for aged must be more optimum than for the younger. (Plomp and Duquesney, 1980).

By this it would appear that those aged persons who have rejected amplification have failed to make satisfactory adjustment to the aidiag process. However, intensive counselling before hearing aid selection helps to minimize any false expectation the individual may have about hearing aids providing perfectly 'natural' sound and 'clearing up' the hearing aid (Alpiner, 1970).

In the present survey although majority seemed to be well adjusted, it must be noted that it was based on mere verbal report. But this may be at variance with the actuality.

IX. Attitudes of users towards the Aid:

Kodman (1967) reported that only a small percentage of the hard of hearing population poses special problems in accepting, adapting successfully to using his hearing aid.

In the present survey most of the subjects accepted the aid without having significant negative attitudes towards it. Some accepted as there was no other choice. But the very fact that they attended the follow-up program is indicative of the positive attitudes. The reasons could be that the hearing aid was offering positive assistance in their social and vocational

spheres. This also speaks favourably of the selection procedures employed and the counselling protocols.

The dissatisfaction of the hearing aid could be aa a part of dissatisfaction with other things in the life. May be they are adjusting to change routine of life and dissatisfaction may adjusted as they adjust to other problems.

This group had a negative attitude towards the hearing aid because other means/additional means of providing help to this group were not available. Geriatric aural rehabilitation programs are very few which indicates the need for such programs.

SUMMARY AND CONCLUSIONS

Summary:

The purpose of the present survey was to know some characteristics of the elderly hearing aid users and their knowledge about the hearing aid.

There were 57 subjects who formed a heterogenous group. Questionnaire - interview method was used. The data collected were converted into percentages and analysed.

On the basis of results obtained, the following conclusions seem warranted.

(1) The follow-up interview is an useful method for surveying the hearing aid users. (However, as there were no professionals and rural population were very few and so this method should be controversial)

(2) More number of male hearing aid users than females.

(3) Advanced age does not seem to determine use of hearing aid.

(4) Elderly hearing aid users were aware of the operation and maintenance of the aid.

(5) Hearing aid are used for extended periods in a day by the elderly.

(6) The hearing aid was useful to the elderly persons in hearing environmental sounds and speech.

(7) Positive attitudes towards the hearing aid was observed among the elderly.

(8) Intensive counselling before and after hearing aid selection is necessary.

(9) Since the geriatric aural rehabilitation programs are very few, the need for such programs exists.

(10) In view of the fact that many were act utilizing the aid to the maximum benefit, the contributing factor should be investigated.

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APPENDIX-A

I. General History:

Name: Age: Sex: F/M AIISH No.
Literate/Illiterate Date:
Education: Employment
Religion: Marital status: M/s/w T-User/Hon-T-User
Residential: SF/JF/HFA
Language: M.T: O.Ls:
Most often used language:
Income: Personal: Family:

II. Audiologic and Medical History:

- a) Age when the hearing loss noticed first
- b) Has the hearing loss: Progressed/fluctuating/remained constant
- c) specific problems associated with the ear:
 - R/L/B/ho - without aid
 - R/L/B/No - with aid
 - Vertigo - Yes/No CSOM: R/L/B/No
- d) Exposure to noise: Yes/No
 - If yes. No.of hours/day: Type of noise:
- e) Associated problems:
 - Visual Motor Systemic disease:

III. Information about the Hearing Aid Use: Care and Maintenance:

How was the hearing aid obtained:
Free/Purchased/Aided-cost:
Body Level/BTE/Others: Indian/Imported Model No.

Date of acquisition of aid:

Ear fitted: R/L/E/B

V/Y/S/Bin

Earmold/Ear tip

1. General

a. Period of use of hearing aid

b. No.of hours used/day

- situation/s

e. Any problem with the aid or
in its use

d. Placement

e. Checking the aid

f. Who checks

g. Condition of the aid.

2. Cell

a. Type of cell used.

b. Checking cell

c. Who checks

d. Insertion procedure

e. How often changed

f. Who changes

g. $\frac{1}{2}$ yearly expenditure.

3. Switch/Mic:

a. Condition

b. Identification

c. Manipulation

- d) Use of dust cover
- e) $\frac{1}{2}$ yearly expenditure
- 4. Vol/Tone control:
 - a. Usual setting
 - b. Is it changed/when
 - c. To what position
 - d. $\frac{1}{2}$ yearly expenditure
- 5. Cords:
 - a. Condition
 - b. Checking/method
 - c. who checks
 - d. How often changed
 - e. $\frac{1}{2}$ yearly expenditure
- 6. Mould/Tip:
 - a. Condition
 - b. Insertion R/L
 - c. Any difficulty
 - d. Which is preferred/why
 - e. Cleaning procedure
 - f. How often cleaned
 - g. who cleans
- 7. Repair:
 - a. How often repaired
 - b. Who repairs/Where repaired
 - c. Expenditure for repair
 - $\frac{1}{2}$ yearly.

- d. Travelling expenditure
- e. Who meets the expenditure
 - for repairs
 - for spares/accessories

IV. Adjustment with the aid:

1. Hearing for nonspeech sounds:

Do you hear the following:

- a. Warning signals(bus horn, siren, fire engine within 5-20 ft)
 - b. Cycle bell on the road.
 - c. Door bell, knock on door
 - d. Water running in another room when others can hear it.
 - a. Hiss of pressure cooker from next room.
 - f. A telephone ring(6ft.away)
3. Hearing for speech sounds:
- a. Can you hear your name called from next room.
 - b. Can you recognize voices of different people like family members.
 - c. Hear a vegetable vendor call from outside the house
 - d. Understand speech in a face to face situation.
 - at home
 - at work
 - at other places.

- e) Differentiate speech of men and women.
- f) Understand speech when you cannot see the face of the speaker.
- g) Understand speech over TV (specify distance)
- h) Understand speech over Radio (Specify distance)
 - Do people complain that you play Radio or TV very loud?
- i) Understand conversation with one person in the presence of noise.
 - at home(Radio, Kitchen, Music)
 - at work(Traffic, Typewriter, machine)
- j) Understand speech when more than three people are participating in a conversation
 - at home
 - at work
- k) Can you follow conversation on the telephone?
 - T/M/MT
 - Ear preferred
 - In the presence of noise (specify noise)

V. Attitude towards the Aid:

- 1. You wear the hearing aid because:
 - a) It helps in hearing
 - b) You are confident to converse.

- e) People talk more when you are wearing the aid.
- 3) You can do your work more effectively.
- e) People talk more slowly and clearly which helps you in understanding better.
- 2. Do not like to wear the aid because:
 - a) Of expenditure
 - b) Conspicuousness
 - c) Hearing loss becomes evident
 - d) Is not of any help in conversation.
 - e) Of age
 - f) People avoid talking to you or exclude you from conversation.