

**PROFILES OF CHALLENGING LISTENING SITUATIONS
EXPERIENCED BY PEOPLE WITH HEARING LOSS: EFFECTS OF
SOCIOECONOMIC BACKGROUND**

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May, 2017

CERTIFICATE

This is to certify that the dissertation entitled “**PROFILES OF CHALLENGING LISTENING SITUATIONS EXPERIENCED BY PEOPLE WITH HEARING LOSS: EFFECTS OF SOCIOECONOMIC BACKGROUND**” is the bonafide work submitted in part fulfillment for the degree of Master of Science (Audiology) of the student (Registration No. 15AUD004). This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree

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This is to certify that this dissertation entitled “**PROFILES OF CHALLENGING LISTENING SITUATIONS EXPERIENCED BY PEOPLE WITH HEARING LOSS: EFFECTS OF SOCIOECONOMIC BACKGROUND**” is the result of my own study under the guidance of **Dr. Rajalakshmi. K**, Professor in Audiology, Department of Audiology, All India Institute of Speech and Hearing, Mysore and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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ABSTRACT

Objective: The main objective of the present study was to explore the profiles of challenging listening situations experienced by people with hearing loss who have different socioeconomic backgrounds.

Introduction: The lifestyle and expectations vary widely across different socioeconomic status. Different SES differ in day to day lifestyle, economic, religious, work nature, educational level, income etc. These factors also influence the listening needs of the hearing impaired and outcome by the hearing aid. Use of questionnaires before and after provision of services to clients, helps in potentially assessing the impact of all components of a rehabilitation program.

Method: Client Oriented Scale of Improvement (COSI) and Hearing Aid User's questionnaires (HAUQ) were translated to Kannada language. Later the same was administered on 200 adults ranging from 18 to 58 years with mild to severe hearing loss and using digital hearing aid/s at least since 3 months. Information was collected using personal and telephone interview method in addition, some demographic information was collected in order to classify them into different socioeconomic categories using Modified Kuppuswamy's socio economic scale.

Results and Conclusion: Conversation with one or two in quiet conditions and conversation with group in quiet were preferred as top priorities among upper and upper middle socioeconomic strata (SES) participants and conversation with one or two and with group in noise were preferred with top priorities by people of unprivileged SES. People of privileged SES had higher needs of listening over telephone than people of unprivileged SES. Increased social contacts was more preferred among privileged SES. Listening to TV or radio was required with more or less priority by people of all SES. Hearing aids were able to satisfy more than 50% of

participants, of whom higher satisfaction was found among participants from unprivileged SES. Participants of privileged SES required more help from their hearing aids but were unable to get. Participants of higher SES obtained more help from their hearing aid/s in situation such as meetings, social gatherings, offices etc. participants of unprivileged SES had difficulties in placing or removing hearing aids and adjusting controls of hearing aid/s. Satisfaction was found to be more among participants of unprivileged SES. Multiple programs option were majorly liked by participants from upper SES, upper middle SES and middle SES. Most of participants in unprivileged SES liked services provided by audiological clinics. Infrastructure and facilities were one among most commonly liked things. Larger sizes of hearing aids were mostly disliked by participants of privileged SESs. Longer time for audiological testing, treatment and waiting was most commonly disliked by the participants.

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CHAPTER 1

Introduction

The Socio Economic Classification is the classification of people on the basis of different parameters such as education, income and profession etc. Traditionally the two parameters used to categorize consumers were: Occupation and Education of the chief wage earner (Head) of the households. Social stratification of societies include categorization of people into socioeconomic strata, based upon their occupation and income, wealth and social status, or derived power (social and political). As such, stratification is the relative social position of persons within a social group, category, geographic region, or social unit. In present day societies, social stratification typically is distinguished as three social classes (Saunders and Peter, 1990)

- (i) the upper class,
- (ii) the middle class, and
- (iii) the lower class;

In turn, each class can be subdivided into strata, e.g. the upper-stratum, the middle-stratum, and the lower stratum. Moreover, a social stratum can be formed upon the bases of kinship or caste, or both.

The categorization of people by social strata occurs in all societies, ranging from the complex state-based or polycentric societies to tribal and feudal societies, which are based upon socio-economic relations among classes of nobility and classes of peasants. The standard of living, expectation for life, view point of life from an individual and way of living is deeply affected by the strata of individual to which he belongs to. Generally lower standards of living, poor quality of health are associated with

lower socio economic strata and better quality of living and relatively better health conditions are associated with upper socio economic strata as access to resources for life style and health are better in them. The main goal of an individual from lower socio economic strata is always focused on bread and shelter to his family. Thus health and quality of living will be his next objective. Determining the structures of social stratification arises from inequalities of status among persons, therefore, the degree of social inequality determines a person's social stratum. Generally, the greater the social complexity of a society, the more social strata exist, by way of social differentiation (Grusky, David B, 2011).

Quality of life in poorer socio economic class is always reported to be poorly satisfied. In a cross-sectional population-based analysis of a representative sample of Australian men it was observed that males of lower socio economic strata had poorer satisfaction with physical health, mental health and environment. But this trend was not seen for social relationships. The percepts of quality of life is also poor in upper most socio economic strata in terms of psychological health (SL Brennan, LJ Williams et al 2013).

People from lower economic strata are found to be more associated with work such as agriculture, manufacturing industry, construction work, work in garages etc. which involves physical actions. This can make person uncomfortable to use hearing aids as hearing aids are prone to fall. Excessive noise found in their work place as well as living place can interfere with amplification as ambient noise is a main issue that causes discomfort to user. Thus there is presence of potential of reduction in hearing aid satisfaction.

Measuring hearing aid outcome is an important aspect of audiological rehabilitation (Cox et al., 2000; Dillon et al., 1999; Dillon & So, 2001). It is very rare that in clinical program we include all rehabilitation options which has different types of hearing aids, training in strategies for coping with hearing loss, and counselling in dealing with the emotional aspects of hearing loss which will be useful for the individual with hearing loss. Some outcome measures would yield detailed information about the needs, and audiologist can make use of this information to help and decide which device or type of technology the client would benefit from.

It seems very reasonable to know that the increased cost of the expensive devices be justified by demonstrating benefit additional to that obtained with less expensive devices. Client's outcomes can be measured in two ways; one is the speech intelligibility by objective methods i.e. speech tests and second one, other general method where client is questioned regarding the benefits obtained by the hearing aid in their day-to-day life using questionnaires, subjectively.

The first method measures the benefit by a hearing aid but when we are interested in measuring the efficacy of the overall rehabilitation program which includes reducing anxiety and increase confidence and also hearing aid provision, latter method is best selected. Use of questionnaires before and after provision of services to clients, helps in potentially assessing the impact of all components of a rehabilitation program.

The Client Oriented Scale of Improvement (COSI) is a measure of hearing aid outcome, which allows clinicians to understand a client's goals/needs and measure changes in hearing ability following hearing aid provision. As this measure documents individual

listening situations with emphasis on individual needs rather than following a standard set of questions, it can also be used to better understand the nature of challenging listening situations faced by clients.

Hearing Aids Users Questionnaire (HAUQ; Dillon et al., 1999) can be used to understand hearing aid use and client satisfaction. COSI and HAUQ are believed to be sufficiently reliable, efficient, valid, interpretable, and useful to justify their continued use since 1995 (Dillon et al 1997).

Various factors can influence help-seeking, hearing aid uptake, hearing aid use and satisfaction (Knudsen et al., 2010). Some of those factors may also influence client's listening needs. It was hypothesized that client's listening needs, and challenges in listening situations, may be associated with socioeconomic status (SES). For example, lower SES is associated with overcrowded living conditions – which will increase background noise levels. Home and work environments likely to be noisier for lower SES clients – poorer quality or absent noise reduction materials in buildings, less well-maintained equipment and appliances. In addition, lower SES is also linked to lower educational levels and more of manual kinds of employment. Hence, the workplace and the public schools also tend to be much noisier, making their profiles of listening situations different when compared to those with higher SES.

1.1 Need for the study:

The lifestyle and expectations vary vividly with different socioeconomic strata. In the new era of consumer driven hearing health care, the major index of quality of service is self-report outcomes and satisfaction data (DeJlong and Sutton, 1995).

The notion of hearing loss has changed across the time. Previously thoughts were more concerned with making person to hear by providing amplification, but the present day thoughts are about how hearing aids assist the person in outweighing the inability caused by hearing loss.

We need to recognize that there are various domains of real life outcomes that cannot be accessed in the laboratory set-up. Individual with hearing loss seeks hearing aid not only because he/she has hearing impairment, also because they are unable to carry out their daily living activities as they want to participate in their family, social and cultural lives. The objective outcome measures fail to easily grasp activity limitations or participation restrictions, since these problems are individualized and mainly depend on the personal circumstances, family situations, life style, culture, economic background, etc. To quantify them we need self-report data.

It seems very reasonable to know that the increased cost of the expensive devices be justified by demonstrating benefit additional to that obtained with less expensive devices. We cannot assure either by matching target gains by prescriptive formulae or by speech recognition scores, that the hearing aid is benefitting the individual with hearing loss. The literature context with respect to subjective verification procedures are very limited in Indian scenario. Hence, there is a need to study the outcome measures with different SES which in turn help the audiologist in achieving the goal of satisfactory aural rehabilitation.

1.2 Aim

The main aim of the present study was to explore the profiles of challenging listening situations experienced by people with hearing loss who have different socioeconomic backgrounds.

1.3 Objective of the study

- To examine the relationship between hearing aid use (outcomes) and socioeconomic status
- To translate English self-questionnaires into South Indian Kannada language.

CHAPTER 2

Literature Review

Hearing aid satisfaction has been always related to the dimensions of appearance, cost, comfort, acoustic benefit and service (Cox and Alexander, 1999, Kochkin, 2000). Measuring hearing aid outcome is an important aspect of audiological rehabilitation (Cox et al., 2000; Dillon et al., 1999; Dillon & So, 2001). As views, needs, situations and attitudes differ it's very necessary to assess and track the outcomes in the way of providing efficient and customized care to improve the health related quality of life. Thus customization of rehabilitation services has become a major step in approaching successful rehabilitation. Documentation of treatment outcomes from patient's perspective is essential, to achieve this the research investigators, supervisors, clinicians, financiers are showing interest (Bentler, & Kramer, 2000; Cox & Alexander, 2002). "Assuring that the audiological intervention provided by hearing health-care professionals is at a high level should lead to improvements in patient's health-related quality of life (HRQoL) " Chisolm et al., 2007.

It is very rare that in a clinical program we include all rehabilitation options which have various types of hearing aids, providing necessary knowledge and training about strategies to get accustomed with hearing loss, and providing effective counselling in tackling with the emotional aspects of hearing loss that will be useful for the person with hearing loss. Some outcome measures would yield detailed information about the needs, and audiologist can make use of this information to help and decide which device or type of technology the client would benefit from.

To assess the benefit of hearing aid in multiple domains as satisfaction, benefit, participation restriction, activity limitations etc. many self-report measures have been developed.

Table 2.1 List of commonly used self-report outcome measures.

Sl. No	Questionnaire	Authors	Year
a.	Hearing Handicap Scale (HSS)	High, Fairbanks, & Glorig	1964
b.	Hearing Measurement Scale (HMS)	Noble and Atherley	1970
c.	Hearing Performance Inventory (HPI)	Giolas, Owens, Lamb, & Schuber	1979
d.	Self-assessment of communication (SAC)	Schow & Nerbonne	1982
e.	Hearing Aid Performance Inventory (HAPI)	Walden, Demorest & Heple	1984
f.	Profile of Hearing Aid Performance (PHAP)	Cox & Gilmore	1990
g.	Hearing handicap inventory (HHI)	Newman, Weinstein, Jacobson e Hug	1990
h.	Profile of Hearing Aid Benefit (PHAB)	Cox, Gilmore & Alexander	1991

i.	Shortened hearing aid performance inventory (SHAPI)	Schum & Dillon	1992
j.	Abbreviated profile of hearing aid benefit (APHAB)	Cox & Alexander	1995
k.	Client oriented scale of improvement (COSI)	Dillon, James & Ginis	1997
l.	Profile of aided loudness (PAL)	Mueller and Palmer	1998
m.	Glasgow hearing aid benefit profile (GRABP)	Gatehouse	1999
n.	Hearing aid users questionnaire (HAUQ)	Dillon et al	1999
o.	International outcome inventory (IOI-HA)	Cox et al.,	2000

Schum (1992) administered the 64 item Hearing Aid Performance Inventory (HAPI) to evaluate the benefit of hearing aid and to develop normative data for older individuals. 158 subjects were selected in the age range of 65 to 80 years. Results reported that elderly individuals reported less benefit than younger individuals from their original normative study for the same measures. In this study degree of hearing loss, hearing aid style or hearing aid experience did not influence the satisfaction levels but it was influenced by the number of hours per week the hearing aid was used.

Newman & Weinstein (1986) studied the perception of hearing handicap by elderly men and their spouses. Thirty hearing impaired subjects were involved in this study, Hearing Handicap Inventory for Elderly (HHIE) and a modification of the HHIE for spouses, Hearing Handicap Inventory for Elderly for spouses (HHIE-SP) were used to examine the same. They found poor relation for emotional sub-scale compared to social/situational sub-scale on correlation analysis. This suggests that situational problems faced by an individual with hearing impairment were more easily observable by hearing impaired individuals than by their spouse compared to emotional responses. This can also be used to counsel the hearing impaired individual and their spouse.

Schow & Tannahill (1977) administered a self-assessment measure, The Hearing Handicap Scale (HHS) on 50 individuals who were divided into three groups based on pure tone audiometric thresholds to obtain the HHS scores for different degree of hearing loss. Group 1 had 20 subjects whose pure tone audiometric thresholds were 10dBHL or better. Group 2 had 10 subjects whose pure tone audiometric thresholds were between 11 to 25 dBHL. Third groups had 20 subjects with their pure tone audiometric thresholds being greater than 25dBHL. The authors found that Hearing Handicap Scale (HHS) scores may be categorised into one of the categories ranging from “no handicap” to “severe handicap”.

Wood and Lutman (2004) conducted a study to check the association of speech recognition ability and self-assessed hearing aid benefit. 100 subjects were involved in this study who were linear analogue hearing aid and digital hearing aid users. The range of degree of hearing loss was mild-to-moderate SNHL. To measure the self-assessed hearing aid benefit, The Abbreviated Profile of Hearing Aid Benefit (APHAB) and The Glasgow

Hearing Aid Benefit Profile (GHABP) were used which assessed the quality of life, hearing aid use and user preferences too.

In a study by Lena L. N. Wong, MA, Louise Hickson and Bradley McPherson (2003) the demographic data are often collected from hearing aid users and the effect of such personal parameters have been studied. Age had a slight but significant negative effect on global satisfaction (Hosford-Dunn and Halpern, 2011). At the same time many of other studies have shown that age has no effect on global satisfaction (Kochkin, 1992; Bentler *et al.*, 1993; Gatehouse, 1994; Norman *et al.*, 1994; Brooks and Hallam, 1998; Hickson *et al.*, 1999; Jerram and Purdy, 2001). It may be argued that there may be no differences in the results among studies, this was because studies with negative effect did not have high correlation between age and satisfaction.

Uriarte, Denzin, Dunstan, Sellars, & Hickson (2005) conducted a study on hearing satisfaction using Satisfaction with Amplification in daily life (SADL) questionnaire for older Australian hearing aid users with mean age of 75.32 years. It was compared with the normative data given by Cox & Alexander (2003). They even studied the relation between satisfaction obtained from SADL questionnaire and other participant factors, hearing aid variable and several other outcome measures. They distributed the questionnaire through mail to 1284 adults 3 to 6 month's prior. Participants were digital programmable hearing aid users of several styles (22.5% BTEs, 34.8% ITEs, 41.8% ITCs, 0.9% nonstandard [NS] devices). Results revealed that various variables that influenced the satisfaction levels were degree of hearing loss, type of hearing aid and style of hearing aid used. There was significant improvement in SADL satisfaction score as reported by participants.

Increase in the age and hearing difficulty together can contribute to greater satisfaction with benefit, cost, service, and with image-related issues (Hosford-Dunn and Halpern, 2001). It's shown by some studies that there's no effect of gender (Hickson *et al.*, 1999; Jerram and Purdy, 2001) whereas in a study by Brooks and Hallam (1998) it was seen that there was slightly higher satisfaction in female participants as compared to male participants.

Despite of low correlation coefficients some studies have reported that experienced users had better satisfaction than the unexperienced users (Bentler *et al.*, 1993, Jerram and Purdy, 2001). Cox and Alexander (2000) used the Expected Consequence of Hearing Aid Ownership (ECHO) and the SADL to study effect of experience on expectation and satisfaction. It was observed that inexperienced users showed less satisfaction than anticipated. This trend was associated with realistic expectations about the performance by the hearing aid from experienced users. They need to be accustomed to the newly reproduced sounds from their hearing aids (Kapteyn, 1977). Although this factor alone don't have potential to affect satisfaction, it's possible to interact with other factors to affect satisfaction positively or negatively. For example, Hosford-Dunn and Halpern (2001) found that users without experience with less severe loss and had more advanced hearing aids were less satisfied with their hearing aids than those patients who were experienced and had more severe loss and less advanced hearing aids than previous. Users with experience with higher degree of hearing loss and were wearing smaller aids tended to have more satisfaction with appearance of the aid.

Besides age, gender etc. the main demographic parameter related to study is SES (Socio economic status of individual). Humphrey et al. (1981) observed in this study that

there was no relation between socioeconomic status and hearing aid uptake. The population for the study was beneficiaries of National Health Service (NHS) United Kingdom, under this patients were fitted with hearing aids at free of charge.

J. Christopher K. Jerram & Suzanne C. Purdy, 1998 in their study used Modified Abbreviated Profile Hearing Aid Benefits, Hearing Attitudes in Rehabilitation Questionnaire, and Communication Profile for the Hearing Impaired, showed that the demographic factors did not affect the performance with hearing aid and hearing aid outcomes to greater extent.

Garstecki and Erler (1998) found that the level of income satisfaction was greater among those who are adherent to hearing aid than those who are not adherent to hearing aids. Cost can be a determining factor for obtaining hearing aid for an individual and has a potential influence on satisfaction. Apparently there are only sporadic studies on effect of cost on hearing aid satisfaction and outcomes. In a study by Hosford-Dunn and Halpern in 2000 they have found that the cost had direct effect on the SADL's Positive Image Scale.

It was observed that socio economic status was not related to outcomes and satisfaction of hearing aid users (Gatehouse, 1994; Norman *et al.*, 1994; Hickson *et al.*, 1999; Jerram and Purdy, 2001). The status of user's employment (not employed, part time, and full time) did not contribute in satisfaction and outcomes significantly. Humes *et al.* (2003) observed that socioeconomic status had nothing that significantly differentiates the accepting hearing aid group from the hearing aid rejecting group i.e. study demonstrated no effects of the variables on hearing aid uptake.

Gussekloo et al (2003) noticed the absence of differences in income levels of those who accepted a hearing aid rehabilitation program and those who did not. Analysis of regression was done to predict the hearing aid satisfaction with pre-fitting measures as independent variables. In line with above findings study by Lupsakko et al (2005) observed similar results in their study on factors that distinguished non users (who had procured hearing aids) from part time or full time users and it was seen that the income of non-users group was approximately half of the median income of the rest two groups, showing that the annual income of a hearing aid user could have influenced. This was the main indication hearing aid user's annual income may have influenced on a person's willingness to continue using hearing aids which he had already procured. Here the hearing aids were given free of cost but the user will have to buy batteries themselves to continue using them.

When it comes to outcomes of aural rehabilitation in case of paediatric clients, parental intervention plays major role in successful rehabilitation. Ozcebe et al (2005) suggested that delay in identification of hearing loss and its intervention was highly influenced by poor socioeconomic circumstances and a low level of knowledge in a family. Tsakiropoulou E et al (2007) mentioned in their study that patient's social and economic status has strong influence on improvement of quality of life by the use of hearing aids. Hearing aid fitting is not one-off event it requires regular follow- up and periodic maintenance, this involves cost which have to be met by patient themselves though social security policies cover initial cost. This is the stage where difficulty arises for people those who are hailing from lower socio economic status and this difficulty may be the probable reason why these patients usually miss out follow-up and maintenance sessions. These follow-up sessions are critical for fine tuning of the hearing aid and better customization

which is required for better satisfaction and outcomes from the hearing aid (Saunders GH, Lewis MS, Forsline A, 2009). Stuart Gatehouse in 1994 in his study on Components and Determinants of Hearing Aid Benefit had mentioned that Socio economic status is an important parameter in determining the outcomes of hearing aid and he had observed that SES had a positive correlation with satisfaction (Knudsen, Oberg, Nielsen, Naylor, & Kramer, 2010). In a study by Margaret Uriarte (2005), it was seen that there was a trend of fully subsidized hearing aid recipients having better satisfaction than the partially subsidized and non-subsidized recipients but this was not significant.

Yucel and his colleagues (2008) reported that the lower socioeconomic status and lower level of awareness of the families, and the prolongation in obtaining a hearing aid device due to economic limitations are the major factors that may contribute to the increase in the interval between amplification and intervention, which has deleterious effect on benefits and outcomes.

In a survey study conducted by Sibylle Bertoli et al (2009) compared the satisfaction from German-speaking parts of Switzerland, the French- and Italian-speaking were more likely to use their aids regularly, and the French-speaking were more satisfied with their aids. As the procedure of hearing aid provision is the same across the country, this difference could be related to differences in socio economic status of linguistic groups in Switzerland. French speaking group in Switzerland was found to have higher socio economic status than the German speaking group (Eleni Charitonidi, 2016). They also have showed how demographic variables can also affect hearing-aid use. This study consisted of two groups with respondents aged 75 to 84 years and another group of 65 to 74 years. Previous group was at significantly higher risk of non-regular use compared to latter. Taking

mean hearing aid usage duration of 6.6 years into consideration, it's observed that respondents of this age group must have purchased their aids before 65 years of age. A portion of this group had well anticipated provision for hearing aid procurement even before they needed, this may be due to variations in the reimbursement system which pays higher contributions to those who are still at work than retired. Thus economic factor being affected in outcome of hearing aid use.

Abdellaoui, A., & Huy, P. T. B. (2013) in their survey study in France regarding factors responsible for success and failure for hearing-aid prescription showed that patients chose to go for cheaper hearing aids than the ones prescribed for them. SES was one of determining criteria for choice of hearing aids.

- Fitting specialist's advice (37%)
- Price (30%)
- Effectiveness on trial (18%)

Amazingly 80% of the trails were successful and 90% found their hearing aids to be reliable and 87% found it well-adapted to their needs showing that SES of the subject did not affect the satisfaction of hearing aid users.

In a study, Eyalati et al, (2013) observed that there was decrease in the score of the parent's needs questionnaire with the increase in the level of the parent's economic status. This finding gives an inference that parents who have higher socioeconomic status have better information about domains of the questionnaire. The principle reason that can be ascertained for this could be that the socioeconomic level of parent appears to be a major variable contributing to a child's ownership of hearing aids, maintenance of the hearing aids,

access to special intervention services, and use of public welfare systems, which in turn are responsible for comprehensive development and better outcomes from child with hearing aid

From studies reported in the literature, we can conclude that the results on effects of socio economic status on hearing aid outcomes are mixed and it's difficult to draw mere conclusion about them.

Socioeconomic status (SES) is one of the most important social determinants of healthcare and state of wellbeing, hence we require standardized and reliable scale for categorization. Though UK and USA have been using scales based only on occupation, India had been using different scales giving a continuum of scoring. Prasad's (1961) gave a classification which is based on per capita monthly income and it was later modified in 1968 and 1970 this is in extensive use. Another scale is Kuppuswami scale (1981) which is widely used to measure the socio-economic status of an individual in urban community, this is based on three variables they are, education, occupation and income.

For the rural areas, Pareekh (1981) gave a classification based on 9 characteristics, they are caste, occupation of family head, education of family head, and level of social participation of family head, landholding, housing, farm power, material possessions and type of family. K. Mary Ramola, A. Velmurugan (2016) in their study have mentioned that Kuppuswami scale is more comprehensive than Market Research Society of Indi scale and more research is needed to conclude if MRSI scale could replace Modified Kuppuswami scale. The Kuppuswami scale was modified on 1995 by Mahajan, main modification was to determine the socioeconomic status of family by considering the education and

occupation of head of the family and per capita income. The modified Kuppuswami scale also considers adjustment in income for inflation using All India Consumer Price Index (AICPI). Even this has also become impractical in the present day scenario due to lower validity which is in turn influenced by variations in the Consumer Price Index. Other socioeconomic status scale are Bharadwaj (2001) scale on students, Srivastava (1978) Scale, Kulshrestha (1972) scale and Jalota, et.al. (1970) scale on urban families, Shirpurkar (1967) scale and Rahudkar (1960) scale on farm families. NSSO uses very peculiar profile termed as Monthly Per Capita Expenditure of a household to assess the socioeconomic status. Modified Kuppuswami scale had the highest sensitivity (89%) and specificity (83%) in categorising the socioeconomic scale in community compared to Kuppuswami scale, Below Poverty Line scale and Multidimensional Poverty Index Scale (Kattula D., 2016).

Client Oriented Scale of Improvement is one of such tools (Harvey Dillon, Alison Jamest, Jenny Ginnis 1997). In this scale, the client has option to effectively self-report to a questionnaire by nominating up to five listening situations where hearing aid's assistance is greatly required. Conclusion of rehabilitation, is given by reduction in disability and the resulting ability to communicate in the mentioned five situation and they are quantified. Based on correlation analysis, the COSI method is as statistically valid as the much as traditional and lengthy questionnaires. This allows clinician to have comprehensive idea about patient's needs in hearing and changes occurred in listening conditions after fitting of hearing aid.

Dillon, James and Ginnis (1997) studied COSI and its relationship to several other measures of benefit and satisfaction provided by hearing aids and it was observed that of ASS (a single item questionnaire addressing satisfaction with the hearing aid), HAUQ4

and SHAPIE COSI was recommended to be most beneficial measure of clinical rehabilitation outcomes as it is not annoying in process of rehabilitation and has potential to create positives effects on rehabilitation process for individual clients. Authors also have noted a strong relationship between COSI and integrated outcome measures. They mentioned that COSI has major advantages of being client oriented and brief in nature.

Schum D J (1999) said that while using COSI audiologists and patient work together from beginning of the rehabilitation till the end of fitting and benefits assessment once the patient has adjusted himself to the new modality of hearing. This also enables audiologists to alter the procedure of fitting in the point of individual patient's needs and goals. COSI helps in shaping of the rehabilitation process that's not predestined since it's difficult to predict the benefits priory

Cox et al (2000) in their study on "Optimal Outcome Measures, Research Priorities, and International Cooperation" mentioned that using a personalized outcome measure has the disadvantage of being less clearly quantifiable. But Dillon et al (1999) have provided the methods to quantify so that COSI can be well adapted to study. The outcome measure should be able to determine minimum of three areas and recommended to determine five areas to be defined at initial stages of intervention for which patient is looking for and this is enabled in COSI which satisfies the recommended suggestion.

In a study by Lingamdenne Paul Emerson, Anand Job (2014) it was observed that COSI is able to solve the issue of item relevance by allowing patient to identify the communication situations in priority based on the greatest problems. The time taken was only 15 minutes and there were no missing responses. There by making COSI easy and

time efficient to administer. COSI enables hearing aid users to appreciate hearing aid's pros and cons there by giving a true picture of the benefit of hearing aid usage. The authors have used IOI HA in combination with COSI to measure the hearing aid outcomes in rural parts. They have mentioned that COSI along with questions which are not asses in COSI would give better answer to outcomes of hearing aid intervention in a rural community.

CHAPTER 3

Methods

The present study was conducted to explore the profiles of challenging listening situations experienced by people with hearing loss who have different socioeconomic backgrounds. In addition, the relationship between hearing aid use, socioeconomic status and listening situations was also examined. The study also aimed to compare the outcomes across different socioeconomic status.

3.1 Participants

Inclusion criterion

- 200 adults with acquired hearing loss ranging from mild to severe degree from different socioeconomic backgrounds were included.
- Individuals in the age range of 18 years to 59 years were divided into 5 different socio economic groups based on Modified Kuppaswamy Scale (Appendix III)
- Unilateral or Bilateral hearing digital Behind-the-Ear hearing aids with experience of at least 3 months were chosen.
- Aided speech identification scores of the participants were at least 60%.

Participants were recruited from a variety of health care facilities, including a national institute funded by the Indian government, private clinics, and community-based rehabilitation set-ups. This was to ensure that the sample represented a wide range of client's socioeconomic backgrounds.

Exclusion criterion

- Naive hearing aid users were not considered for the study (< 3months)
- Individuals with congenital hearing loss were excluded.
- Individuals associated disorders like tremors, psychological problems were not considered.
- Individuals with diagnosed Auditory Neuropathy Spectrum Disorders, Speech and Language disorders were excluded.

3.2 Translation procedure

Translation of COSI and HAUQ questionnaires was done by using systematic forward-backward translation adaptation procedure which is recommended by Beaton (2000). World Health Organization (WHO), the Medical Outcome Trust recommendations, the Translation, Review, the American Association of Orthopedic Surgeons (AAOS) in their guidelines have recommended four procedural considerations they are;

- i) Multiple forward translations
- ii) Backward translation
- iii) Expert committee review approach
- iv) Pre-final testing.

Using these four recommended methods questionnaires from English were translated to Kannada language.

Multiple forward translations, this is the initial step in translation-adaptation process which says that multiple translators should be employed during the forward translation. This recommends to have at least two bilingual translators. This allows us to identify semantic differences in ambiguous words. As suggested 3 translators from different educational backgrounds were used each from field of speech and hearing, humanities and basic science backgrounds. This helped to avoid attempt to use of field-specific jargon. Translator from humanities and basic science background were familiar with local dialect and culture, translator from speech and hearing field had in-depth knowledge in the field and research methodology. All the three translators were made familiar with translation process there by making translation procedure efficient. After the completion of multiple translations, single combined copy was generated by involving all the translators and key researcher.

Backward translation, was done following multiple forward translation. This is the second major step in the translation-adaptation process. This was done to confirm effective original-to target language translation. It aims to highlight gross discrepancies and conceptual errors. It helped in mapping the semantic equivalence between the original and the target version of the translated measure. The backward translation was carried out by 3 translators who were proficient in both Kannada and English who are not related to the research group and are ignorant of the research concept.

Expert committee review approach. A team consisting 5 experienced audiologists at least with experience of 10 years were given with both forward and backward translation copies and asked to compare and analyze. Their task was to examine whether the translation is accurate and if it maps to the original intent of the items.

Pre-final testing, this is final stage, also called as cognitive interviewing/debriefing. The pre final version of translated questionnaires were administered on a sample of 10 individuals and obtained their opinion/feedback regarding acceptance and understanding of the items. This enabled to verify if the content was simple, clear and appropriate so that it is reachable to target population.

3.3 Data collection

The study was conducted in Mysore, India and employed a cross-sectional survey design. Data was collected using COSI and HAUQ questionnaire. Personal interview and telephone interview method was employed for collecting information.

The demographic information was collected (e.g., age, gender, education, socioeconomic status, religion, employment, degree and type of hearing loss, history of hearing loss in the family, duration of hearing loss, etc.). Modified Kuppuswamy's SES scale was used (Bairwa et al., 2013) to categorize the participants into different socioeconomic backgrounds.

CHAPTER 4

RESULTS AND DISCUSSION

The present study was carried out to investigate the profiles of challenging situations experienced by adult individuals with hearing loss across different socio-economic strata and to validate Kannada adaptation (which was done as a part of this study) of Hearing Aid Users Questionnaire and Client Oriented Scale of Improvement. The participants involved were Kannada speaking individuals with hearing loss of Mild degree to severe degree of hearing loss in the range of 18 to 59 years. Data collection was done by administering Kannada adaptation of HAUQ and COSI on 200 individuals from 5 different socio-economic strata.

The Client Oriented Scale of Improvement (COSI) is a measure of hearing aid outcome, which allows clinicians to understand a client's goals/needs and measure changes in hearing ability following hearing aid provision. This measures document the individual's listening needs with priorities instead of answering pre-set questions. It has an open format which allows the individual to actually choose the listening situations creating the greatest difficulty. As mentioned in the final stage of translation procedure, translated questionnaires were administered on 10 hearing aid users, their opinions and feedback regarding the questionnaire's semantic and syntax were incorporated to finalize the questionnaire. It was seen that adapted questionnaires were able to convey the intended meaning as that of original version of the questionnaire. It has 16 different situations among which the participants ranked 5 situations in priority.

HAUQ is a multi-item questionnaire which addresses the different issues. It explores the potential problems which affect ability of an individual to use and benefit from hearing aid. This questionnaire has different scoring for different questions. Question 1 addresses the number of hearing aid/s the person is using. 2nd question is a 6 point rating scale where scores on right being worse and on left being better response. 3rd question has 6 sub questions which is scored on 4 point rating scale. More the responses on left side better is the outcome of hearing aid that is left side stands for more benefit from hearing aid and right side stands for no use of hearing aid. Question number 4 has 7 sub questions with yes or no option, for questions 4.1 to 4.6 'NO' response indicates there are no difficulties with usage of hearing aid and 'YES' indicates difficulty with hearing aid/s but in question 4.7 it's vice versa. Question number 5 & 7 has 4 options to choose with scores on right side being better and left being poorer. Question number 6 has 5 options and better outcomes move in left to right direction. Question number 8 has 2 option with no difficulty when scores are placed on right side.

Item wise statistical analysis was done using IBM SPSS (version 23) software on responses obtained from questionnaires. Response distribution across the population for each item was obtained by performing descriptive analysis. Association between SES and each item was found out using Chi-square test. Cross tabs were used to obtain both group wise and item wise results. It was assumed that observed counts shall not be less than 5 cells or 25% and level of significance was $p < 0.05$.

The responses obtained in the study subjected to analysis to cover the two objectives of the study.

1. To see the association between listening needs and socio economic strata grouped on the basis of Modified Kuppuswamy's Scale.
2. To see the association of socio economic strata on outcomes of the hearing aids

i. Association between listening needs and socio economic strata.

4.1 Communication situation 1

The 1st communication situation in COSI is conversation with 1 or 2 in quiet (figure 4.1). Of 200 participants 137 participants have assigned a rank to this. 38.7% of those who ranked have ranked it as 1st among whom 24.5% were upper, 18.9% were upper middle, 20.8% were middle, 22.6% were upper lower and 13.2% were lower SES. 39.4% have ranked as 2nd, among them 13.0% were upper and upper middle each, 25.9% were middle, 22.2% were upper lower and 25.9% were lower SES. 21.9% have ranked as 3rd, among them 10.0% were upper, 16.7% were upper middle, 20.0% were middle and upper lower each and 33.3% were lower SES. Order of SES who ranked as 1st priority is upper SES > upper lower SES > middle SES > upper middle SES and lower SES. Order of SES who ranked as 2nd priority is lower SES and middle SES > lower upper SES > upper and upper middle SES. Order of SES who gave 3rd priority is lower SES > middle and upper lower SES > upper middle SES > upper SES. Results indicate that people of upper SES preferred this situation as first priority. And least number of people of lower SES have preferred it as their first priority, for lower and middle SES this was second priority. Better quality of living (Islam M. et al 2014), lower noises in work place as in offices, well built houses may be influencing factors here as much of higher SES poses to have these. In contrast to this, lower SES live in noisy situations, work in noisy environment such as construction places,

factory are expected to be more. These factors could have made people of upper SES to rank the situation as first priority. None of participants have assigned ranks greater than three for this listening condition which means that this situation is one among top listening conditions for all irrespective of SES.

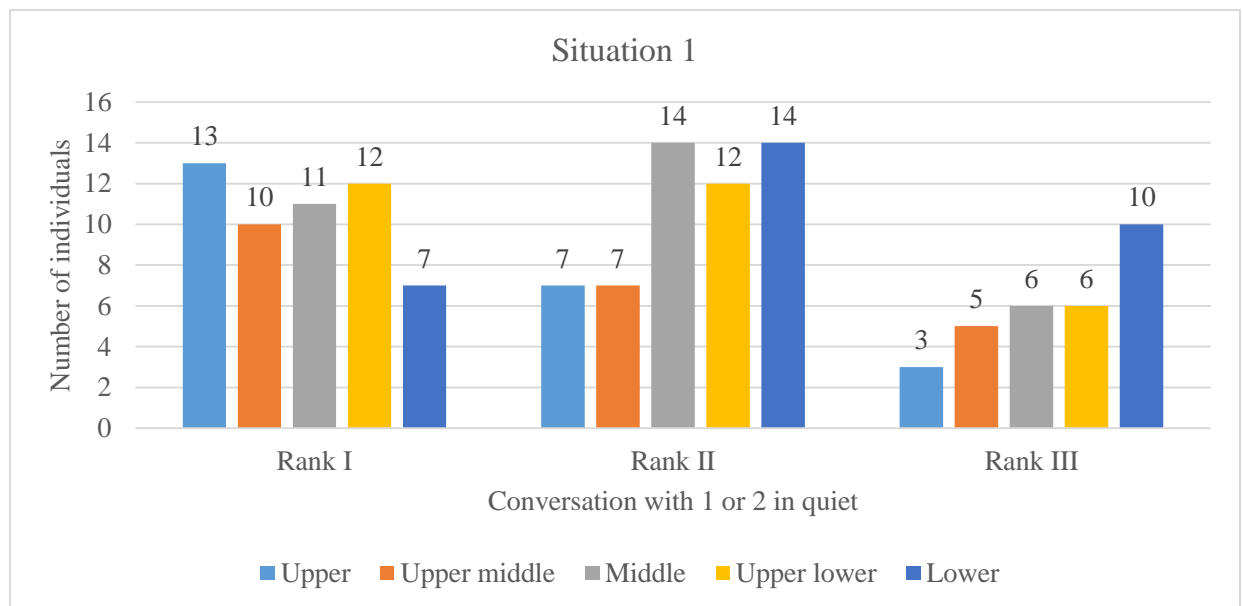


Figure: 4.1 Frequency distribution for Communication situation 1 (Communication with 1 or 2 in quiet) in number of individuals

4.2 Communication situation 2

The 2nd communication situation is conversation with 1 or 2 in noise (figure 4.2). 137 individuals of participated individuals ranked it as 2nd communication situation. 41.6% of individuals ranked this communication situation as 1st among that 14.0% were upper, 10.5% were upper middle, 26.3% were middle, 22.8% were upper lower and 26.3% were lower SES. 40.9% ranked this communication situation as 2nd among them 21.4% were upper, 26.8% upper middle, 14.3% were middle, 23.2% were upper lower and 14.3% were

lower SES. 16.8 % ranked it as 3rd among them 17.4% were upper and upper middle, 30.4 % were middle, 17.4% were upper lower and lower SES. Order of SES which gave first priority to this situation is lower and middle SES > upper lower SES > upper SES > upper middle SES. Order SES which gave second priority is upper middle SES > middle SES > upper lower SES > middle and lower SES. Order of SES who preferred as third is upper, upper middle, upper lower and lower SES ranked equally followed by middle SES. Only lower SES ranked this as 4th. As discussed above much of lower SES are seen to be working in unorganized sectors such as construction, laboring, and busy markets and in industries where noisy situations are apparent. Lower SES are expected to be living in crowd areas such as in slums where noise levels would be high. These factors could have influenced participants of lower SES to rank this situation as their first priority. Upper and upper middle have marked this as second rank, this could be due to needs of communicating in noisy situations such as markets, bus-stand, banking and other public places. Consider a person working as factory worker who belongs to lower half of SES scale, he is expected to communicate in noise with his partners. Whereas an individual working in an office setup who has lesser noise levels than previous condition. In latter condition individual has quieter environment. Only a little portion of the participants have ranked this in last 2 ranks which indicates that this listening situation is one of the top priority listening need for all.

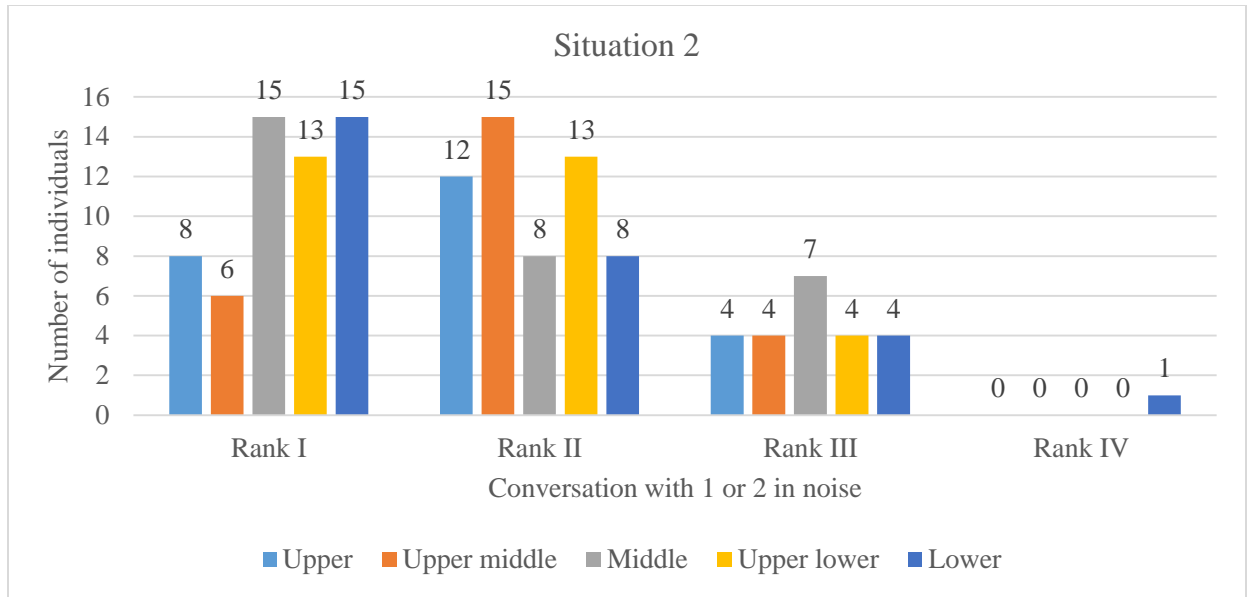


Figure: 4.2 Frequency distribution for Communication situation 2 (Conversation with 1 or 2 in noise) in number of individuals

4.3 Communication situation 3

The 3rd communication situation is conversation with group in quiet (figure 4.3). Total of 106 individuals of all participants assigned ranks to this. 40.6% ranked this communication situation as 1st among them 20.9% were upper, 23.3% were upper middle, 18.6% were middle, upper lower and lower SES each. 49.1% ranked this communication situation as 2nd among them 19.2% were upper, 15.4% upper middle, 21.2% were middle and upper lower each and 23.1% were lower SES. 6.6% ranked it as 3rd among them 14.3% were middle, 42.9% were upper lower and lower SES each. None of the upper and upper middle SES ranked this communication situation as 3rd. Only 3.8% ranked it as 4th among them 75.0% were upper lower and 25.0% were lower SES. None of the upper, upper middle and middle SES ranked this as 4th. Order of SES which ranked this as first is middle, upper lower and lower SES equally ranked as third followed by upper middle and upper. Order

of SES which ranked this as second is lower SES > upper lower and middle SES > upper SES > upper middle SES. Order of SES which ranked this as third are lower and upper lower SES > middle SES. Those SES which ranked as fourth in order is upper lower followed by lower. Participants of upper and upper middle SES have ranked this as their first priority. As much of white collared jobs are seen among higher SES where one could expect lesser noisy conditions, better infrastructures, well organized offices or work places, demands of much communication among colleagues or co-workers, attend to meetings and conferences. These are the places where these individuals are expected to communicate with groups. In ranking this as 2nd priority lower SES takes major share. This could be expected as they got to communicate with family members or many others in home which might be quieter than their work places. A little of participants primarily from lower half of SES have ranked as 3rd and 4th priorities which could be due to individual variations in listening conditions. Much of participants have ranked this situation in top 3 ranks which indicates that this situation is one of the important listening needs.

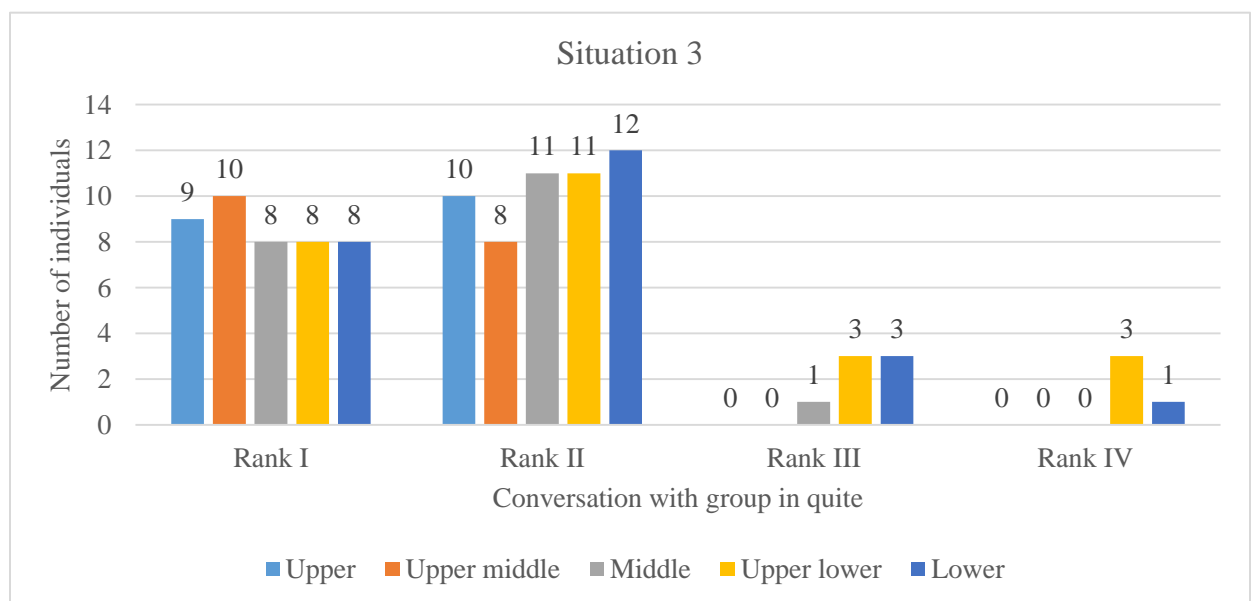


Figure: 4.3 Frequency distribution for Communication situation 3 (Conversation with group in quiet) in number of individuals.

4.4 Communication situation 4

The 4th communication situation is conversation with group in noise (figure 4.4). 117 individuals of total participants ranked this communication situation. 29.9% ranked this communication situation as 1st among whom 25.7% were upper, 34.3% were upper middle, 8.6% were middle, 14.3% were upper lower and 17.1% were lower SES. 23.1% ranked this communication situation as 2nd among them 33.3% were upper, 25.9% upper middle, 18.5% were middle, 7.4% were upper lower and 14.8% were lower SES. 41.0% ranked it as 3rd among them 14.6% were upper, 12.5% were upper middle, 27.1% were middle, 20.8% upper lower and 25.0% were lower SES. 3.4% ranked this as 4th among whom 50.0% were middle, 25.0% were upper lower and lower SES each. None of the upper, upper middle class ranked this as 4th. Only 2.6% ranked this communication situation as 5th among them 33.3% were middle, upper lower and lower SES each. None of the upper and upper middle SES ranked this as 5th. Order of SES which ranked as 1st is upper middle SES > upper SES > lower SES > upper lower SES > middle SES. Order of SES which ranked this as 2nd is upper > upper middle > middle > lower > upper lower. Order of SES which ranked as 3rd is middle > lower > upper lower > upper > upper middle. Order of SES which ranked as 4th is middle followed by upper lower and lower. Middle SES, upper lower SES and lower SES all ranked this as 5th. Much of middle, upper lower and lower SES have ranked this as their 3rd priority which could be due to demands of their nature of workplace. A little number of upper and upper middle SES have also marked as first preference which could be due to need to communicate with multiple partners in noisy situations such as public offices, banks, bus stands and markets etc. Some groups have ranked as second for which reasons could be as mentioned above. Much of participants

have ranked this situation in top 3 ranks which indicates that this situation is one of main listening needs.

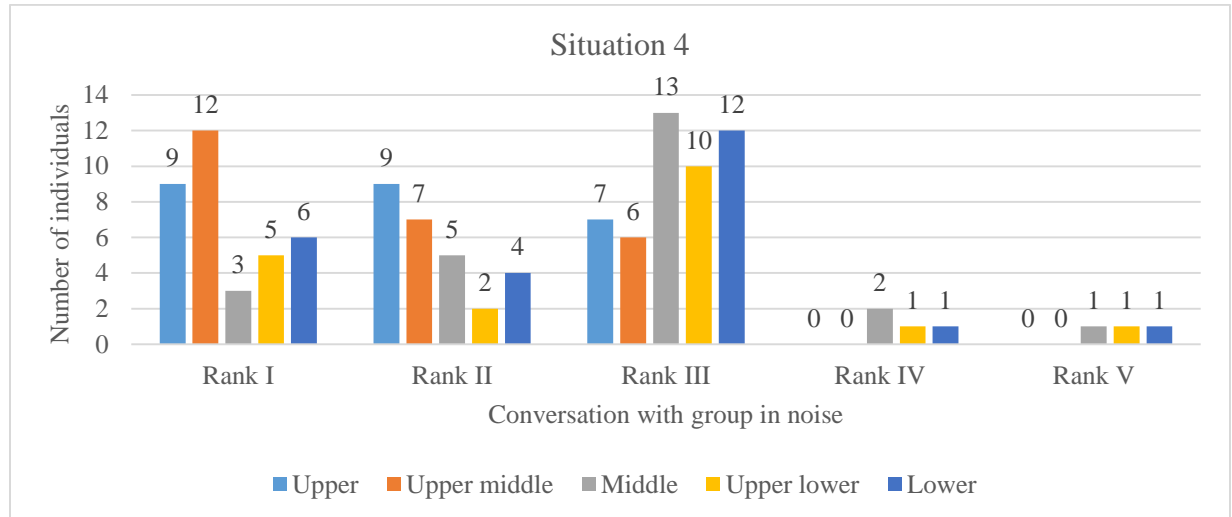


Figure: 4.4 Frequency distribution for Communication situation 4 (Conversation with group in noise) in number of individuals.

4.5 Communication situation 5

The 5th communication situation is listening to television / radio at normal volume (figure 4.5). Of all participants 156 individuals ranked this. Only 3.2% ranked this as 1st among that each of upper middle, middle and upper middle were 20.0% and lower SES were 40.0%. 1.3% ranked this as 2nd among them 50.0% each were upper middle and upper lower. 34.0% ranked as 3rd priority among them 28.3% were upper, 26.4% were upper middle, 18.9% were middle, 17.0% were upper lower and 9.4% were lower SES. 41.0% ranked this as 4th among them 21.9% were upper and middle each, 20.3% were upper middle, 18.8% were upper lower and 17.2% were lower SES. 20.5% ranked it as 5th among them 18.8% were upper and middle each, 15.6% were upper middle, 21.9% were upper lower and 25.05 were lower SES. Upper middle, middle and upper lower followed

by lower SES ranked it as 1st. Only upper middle and upper lower have ranked it as second. Order of SES who ranked it as 3rd is upper > upper middle > middle > upper lower > lower. Order of SES which assigned a rank of 4 is upper and lower > upper middle > upper lower > lower. SES which ranked as 5th followed an order of lower > upper lower > upper and middle > upper middle. Watching TV or listening to radio could not be primary preferences among lower SES, as their primary concern would be successful communication at workplace to make their job secure and work efficiently. Majority of all participants have marked as 3rd, 4th or 5th which indicates that this situation is not a main need for any SES. As act of watching TV or listening to radio is mainly for purpose of entertainment which is not primary need of majority of participants. But higher number of people from upper half of SES have ranked as 3rd and 4th, from this it can be inferred that this listening situation is more needed for higher SES than lower. Most of people in lower SES are found to be working more to fulfil their fiscal needs even house making women work at parts of time such as working as domestic assistant at other homes. Whereas people of higher SES do not have this rigid condition. Perhaps these might be the responses of house wives who might not be working or work only for lesser duration outside.

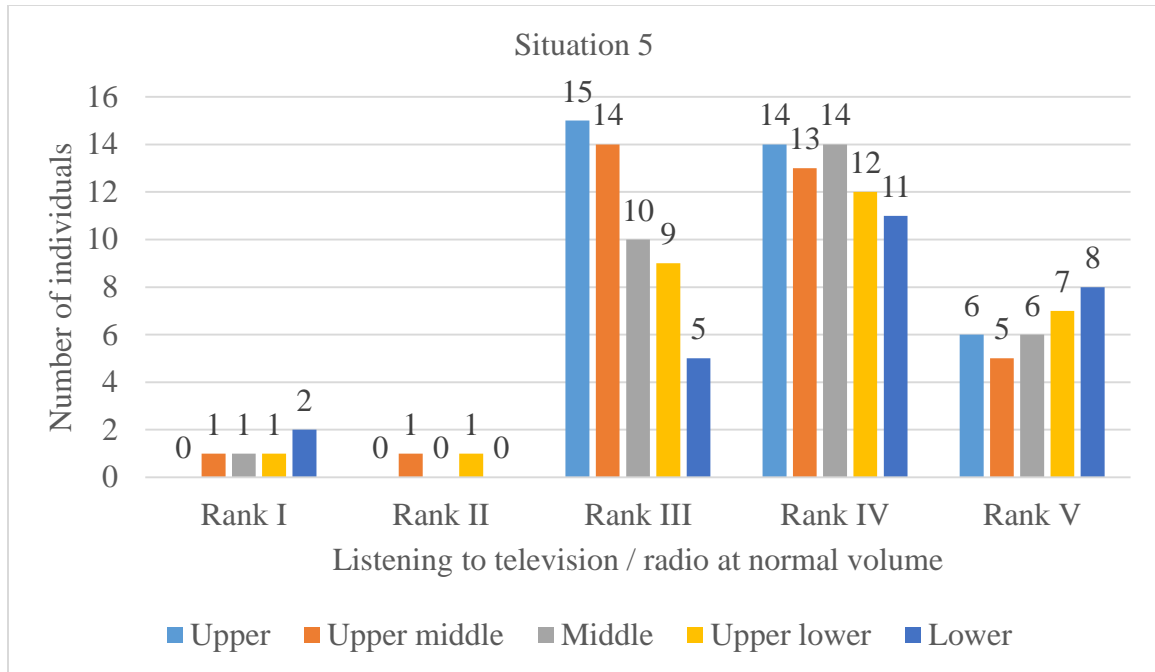


Figure: 4.5 Frequency distribution for Communication situation 5 (Listening to television / radio at normal volume) in number of individuals.

4.6 Communication situation 6

The 6th communication situation is talking to familiar speakers on phone (figure 4.6). Of all 120 individuals ranked this. Only 0.8% ranked this communication situation as 1st which constituted only lower SES. 3.3% ranked this as 2nd which constituted 25.0% each of upper, upper middle, upper lower and lower SES. None of the middle SES ranked this as 2nd. 20.8% ranked this as 3rd among that 32.0% were upper and upper middle each, 12.0% were middle, 20.0% were upper lower and 4.0% were lower SES. 45.0% ranked this as 4th among them 22.2% were upper, 24.1% were upper middle, 20.4% were middle, 16.7% were upper lower and lower each. 30.0% ranked this as 5th among which 19.4% were upper, 13.9% were upper middle, 22.2% were middle, 16.7% were upper lower and 27.8% were lower SES. Only lower SES ranked it as first. Upper SES, upper middle SES,

upper lower SES and lower SES equally ranked as second. Order of those SES which ranked as third is upper and upper middle > upper lower > middle > lower. Order of SES which ranked this as fourth is upper middle > upper > middle > upper lower and lower. Order of SES which ranked as fifth is lower > middle > upper > upper lower > upper middle. This situation is not ranked among one or two ranks which infers that this situation is one among essential listening conditions. Among those who ranked as 3rd or 4th higher SES take major share. Communication over telephones, mobiles or situations such as attending to tele conferences are majorly found in higher SES, this could be one of their primary daily activities. This can be due to increased social contacts or workplace demands where communication over phones are integral part of their work e.g. a software engineer is prone to attend his clients over phone calls than a daily wage labor. It's seen that use of more cell phones was associated with people with higher levels of education (Frias-Martinez, V., & Virseda, J, 2012). Use of cell phones are found to be lesser among under privileged strata (Blumenstock, J., & Eagle, N, 2010). These factors could have made participants of higher SES to rank better than that of lower SES.

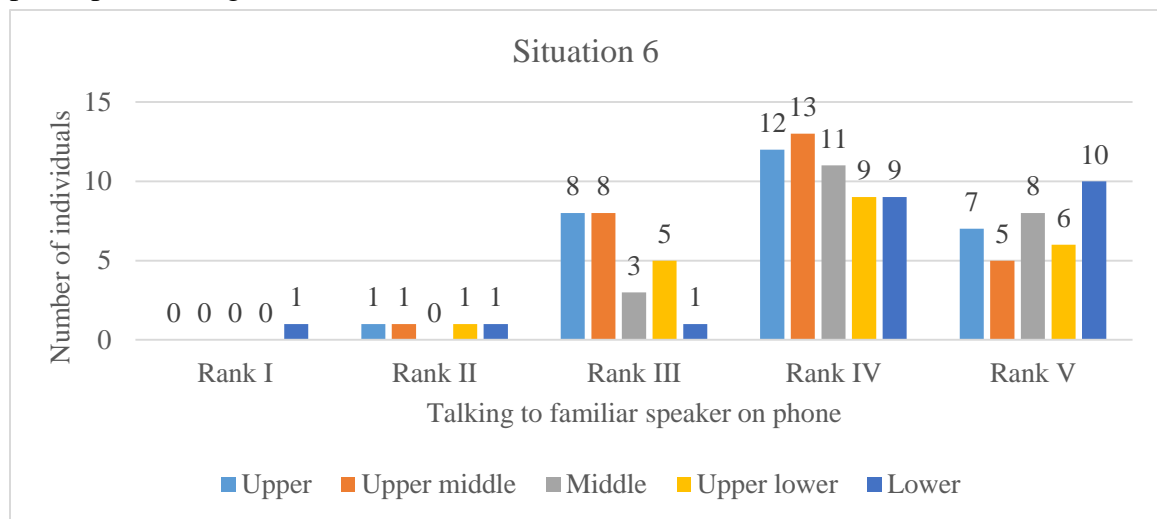


Figure: 4.6 Frequency distribution for Communication situation 6 (Talking to familiar speaker on phone) in number of individuals.

4.7 Communication situation 7

The 7th communication situation is listening to unfamiliar speaker on phone (figure 4.7). Out of all participants 49 individuals ranked this. Among them 1st rank was opted by 4.1%, in that 50.0% were upper and upper middle each, other SES groups didn't rank this as 1st. 14.3% ranked this as 2nd among whom 14.3% were upper, upper middle and upper lower each, 28.6% were middle and 28.6% were lower SES. 28.6% ranked as 3rd among them 21.4% were upper and upper middle each, 14.3% were middle, lower each and 28.65% were upper lower SES. 40.8% ranked as 4th among which 20.0% each were upper and upper middle, 15.0% were middle, 20.0% were upper lower and 25.0% were lower SES. 12.2% ranked this as 5th among them 33.3% were middle, 50.0% were upper lower and 16.7% were lower SES. None of the upper and upper middle SES ranked this communication situation as 5th according to their priority. Both upper and upper middle equally gave first preference. Order of SES which gave second priority is middle and lower followed by upper, upper middle and upper lower with equal preference as second. Upper and upper middle followed by middle and lower followed by upper lower SES ranked as third. Order of SES which ranked as fourth is lower > upper, upper middle and upper lower with equal ranks > middle. Only three SES ranked it as 5th of them order is upper lower > middle > lower. As shown by results out of 200 only 49 individuals have ranked for this situation which indicates that this situation is not of major priority. In ranking as 3rd or 4th majority are from higher SES which could be due to higher numbers of mobile phones among higher SES as discussed in above situation. None of the higher SES have ranked this as last which points out the higher need of speaking over telephone with unknown in contrast to lower SES. Among those who have ranked as 4th number of people from lower

SES is seen to be more, which indicates that need of communication over cell phones are also required for lower SES population.

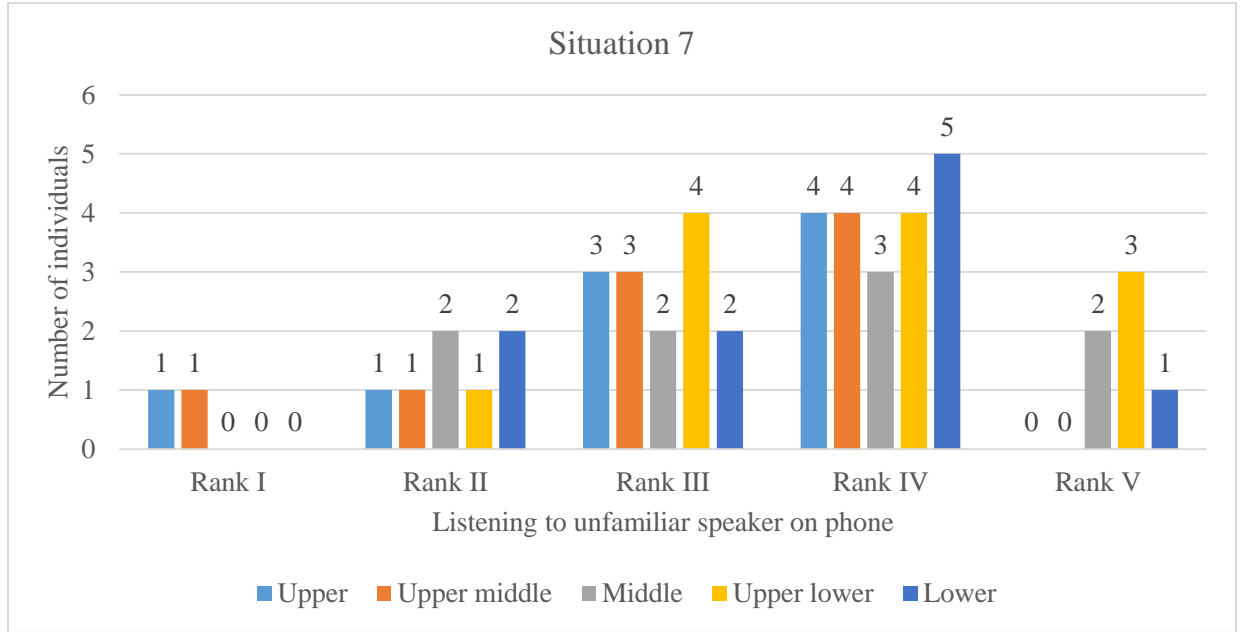


Figure: 4.7 Frequency distribution for Communication situation 7 (Listening to unfamiliar speaker on phone) in number of individuals.

4.8 Communication situation 8

The 8th communication situation is hearing phone ring from another room (figure 4.8). Only 17 of 200 participants assigned a rank to this communication situation. None of the SES group ranked this among first 3 as their priority. 17.6% of them ranked as 4th among that 33.3% of each were upper, upper middle and middle SES. 82.4% ranked this as 5th in that 7.1% each were upper, upper middle and middle, 57.1% were upper middle and 21.4% were lower SES. None of the SES ranked this in first three ranks. Upper SES, upper middle SES and middle SES equally gave 4th priority. In preferring this as 5th upper lower SES stood first than lower SES followed by upper, upper middle and middle SES.

Out of 200 participants only 17 have assigned some rank to this which tells us that this situation is not among top five essential situations for majority of the participants. Hearing phone call might not be a difficult task for individuals who are using hearing aids as phone ring sound is loud. This could reflect only the audibility of sound with the aid not understanding the speech.

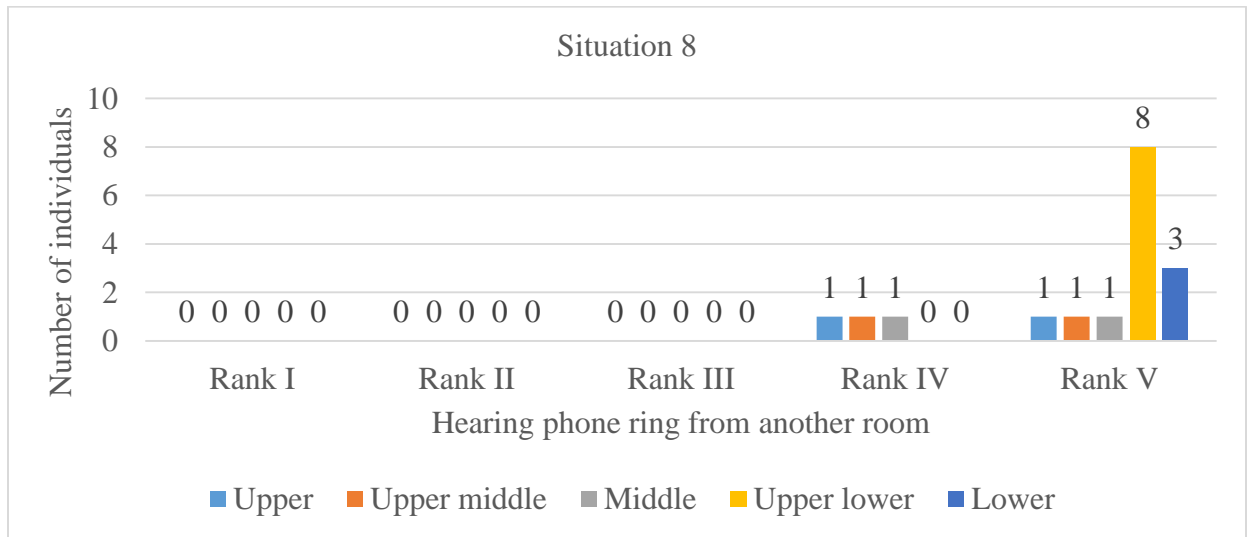


Figure: 4.8 Frequency distribution for Communication situation 8 (Hearing phone ring from another room) in number of individuals.

4.9 Communication situation 9

The 9th communication situation is hearing front door bell or knock (figure 4.9). 20 participants of all assigned some rank to this. None of the SES ranked this communication situation among first 3 as their priority. 30.0% ranked this as 4th among them 50.0% were middle, 33.3% were upper lower and 16.7% were lower. 70.0% ranked as 5th among them 14.3% ranked as upper and upper middle and upper lower each, 28.6% were middle and lower each. Hearing front door bell or knock was not the communication situation among

the first three priority as their choice. None of the upper and lower middle SES ranked this as 4th even. Order of SES which ranked it as 4th is middle > upper lower > lower. Upper, upper middle upper lower and lower SES equally ranked followed by middle ranked as 5th. None of the SES have ranked this among their top three preferences and only 10% of total study population have ranked this which indicates that this situation is not among essential listening conditions. Of all respondents majority were from lower half of the SES scale. This response could have come from house wives or aged people who might not be attending the calling bell. This was not seen in higher SES as majority of them will be working and they might not come across this situation often.

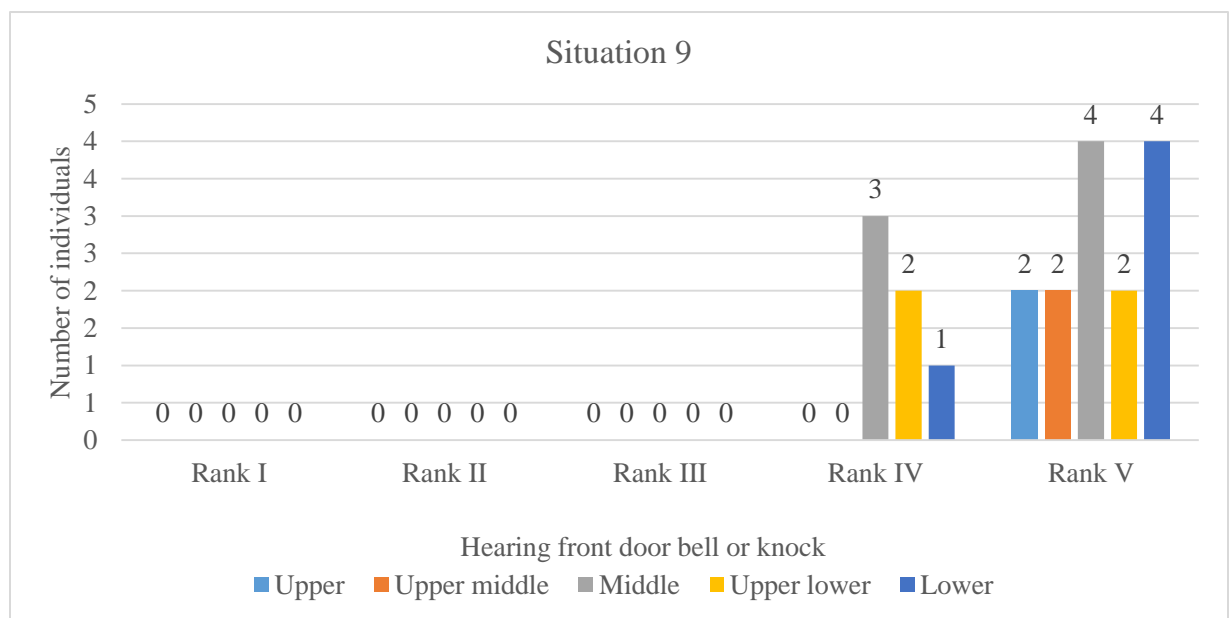


Figure: 4.9 Frequency distribution for Communication situation 9 (Hearing front door bell or knock) in number of individuals.

4.10 Communication situation 10

The 10th communication situation is to hear traffic (figure 4.10). Among them only 39 individuals gave ranks to this out of all participated. 56.4% ranked this as 4th among which 22.7% were upper, upper middle, upper lower and 9.7% were middle SES. 43.6% ranked as 5th among which 41.2% were upper, 47.1% were upper middle, 5.9% were middle and upper lower SES. Again hearing traffic sound was not one among the first three priorities. Upper, upper middle, upper lower and lower SES equally ranked as fourth followed by middle SES. Order of SES which ranked it as 5th is upper middle > upper > middle and upper lower with equal ranks. Of all participants 39 participants have ranked this situation which indicates that this is quite important listening condition. 4 out of 5 SES have ranked as 4th with equal numbers, which indicate that hearing traffic noise is a condition which is needed by all SES. As all people go through traffic for one or other purpose, be it whether an individual is an officer or a daily wage labor they commute on the same roads for various necessities. In ranking this as 5th higher, SES have major share. This could be due to higher requirement or regular need of travelling through traffic. It becomes difficult if one does not hear to traffic when he/she is on roads. Driving or travelling on roads is primarily a visual function with a little important inputs from hearing such as horns or warning sounds. If a person is rehabilitated with amplification (hearing aid or cochlear implant) and can hear reasonably with the device, there seems little reason to deprive him or her from walking or driving. Hearing traffic noise is essential for safe commutation on roads and it is essential for all individuals.

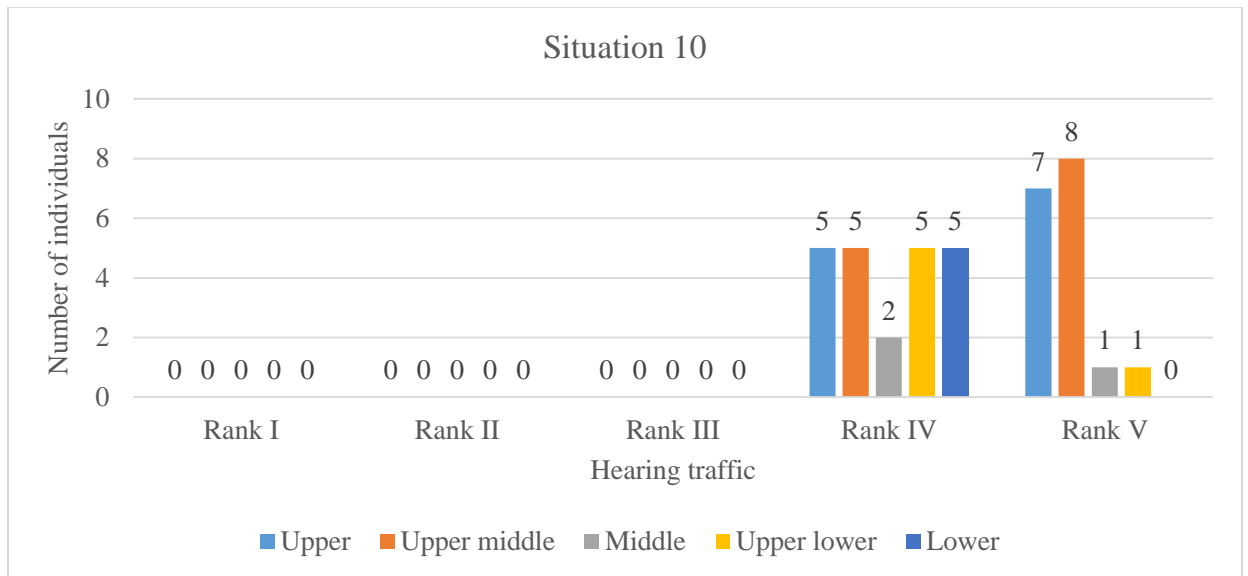


Figure: 4.10 Frequency distribution for Communication situation 10 (Hearing traffic) in number of individuals.

4.11 Communication situation 11

The 11th communication situation is increased social contact (figure 4.11). Of all participants only 35 individuals ranked this communication situation. Among them only 2.9% ranked this as 1st who were from middle SES. 2.9% ranked as 3rd who were from lower SES. 40.0% ranked as 4th among which 21.4% were upper, upper middle, middle and upper lower SES whereas 14.3% were lower SES. 54.3% ranked as 5th among them 26.3% were upper and upper middle, 15.8% were middle, upper lower and lower SES. Only middle SES ranked as first. Only lower SES ranked as third. Upper, upper middle, middle and upper lower SES all equally followed by lower SES ranked as fourth. In ranking this as fifth upper and upper middle SES had equal shares followed by middle, upper lower and lower with equal shares. This was ranked by 19.5% of total population which means this was major communication situation. All the SES have equal shares in ranking this

situation as 4th or 5th. This points towards the necessity of social contact for all individuals irrespective of SES. Despite equal number of ranking there is slightly higher number of participants from upper and upper middle SES who have ranked this. This could be due to higher listening demands from their job, need for attending social gatherings, parties, communicating with surrounding people, colleagues at office and public relations if individual is in service oriented job where it could be only possibly individuals from higher SES.

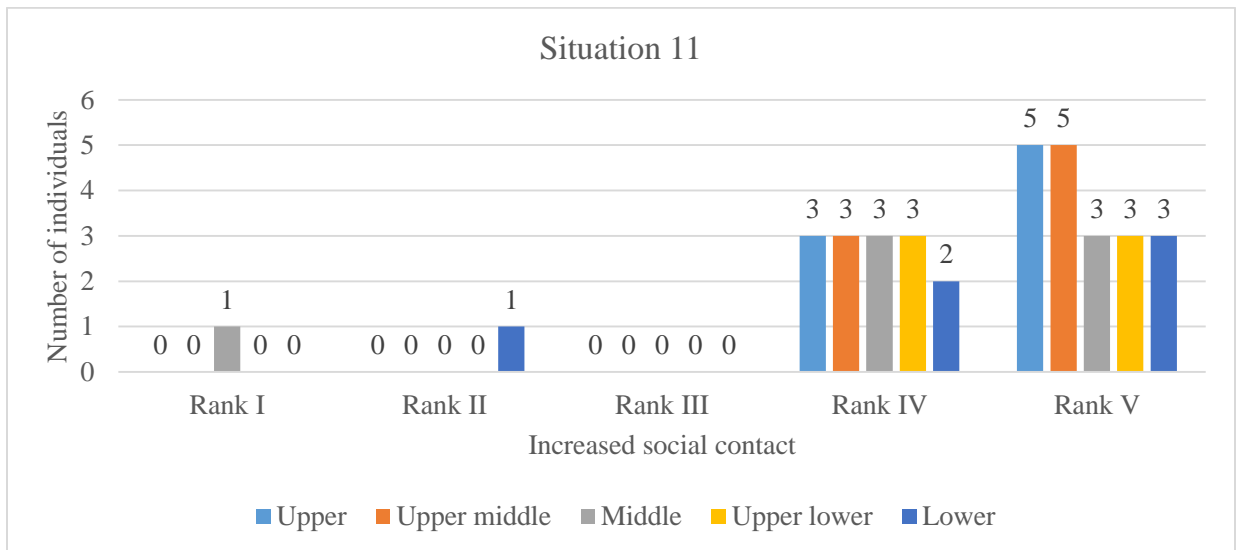


Figure: 4.11 Frequency distribution for Communication situation 11 (Increased social contact) in number of individuals.

4.12 Communication situation 12

The 12th communication situation is feel embarrassed or stupid (figure 4.12). Out of all participants 36 individuals ranked this. Of whom only 2.8% ranked this as 1st. They were from lower SES. 2.8% ranked as 2nd who were from middle SES. 19.4% ranked as 4th among whom 28.6% were upper and upper middle, 14.3% were middle, upper middle

and lower SES. 75.0% ranked 5th among whom 29.6% were upper and upper middle, 22.2% were middle, 11.1% were upper lower and 7.45 were lower SES. Only lower SES gave first priority. Only middle SES gave second priority. Upper and upper middle SES equally ranked as 4th followed by middle, upper lower and lower equally ranked. Order of SES which ranked this as 5th is upper and upper middle equally ranked > middle > upper lower > lower. Though 18% of all participants have assigned rank to this, majority was as 5th priority, this indicates that this listening situation is not an essential situation for majority. Studies have shown that depression, altered self-esteem and affected functional status have come up as consequences of hearing impairment (Chen, 1994; Dugan & Kivett, 1994; Jerger, Chmiel, Wilson, & Luchi, 1995; Mulrow et al., 1990; Wallhagen, Strawbridge, & Kaplan, 1996). Out of those who ranked as 4th or 5th majority are from higher SES, this could be due to embarrassment caused by hearing impairment which could be more prevalent among people from upper higher SES. This could be due to differences in nature of lifestyle, mental status, functional status, and demands from society, work place, being worried about self-image and difficulties in accepting hearing impairment.

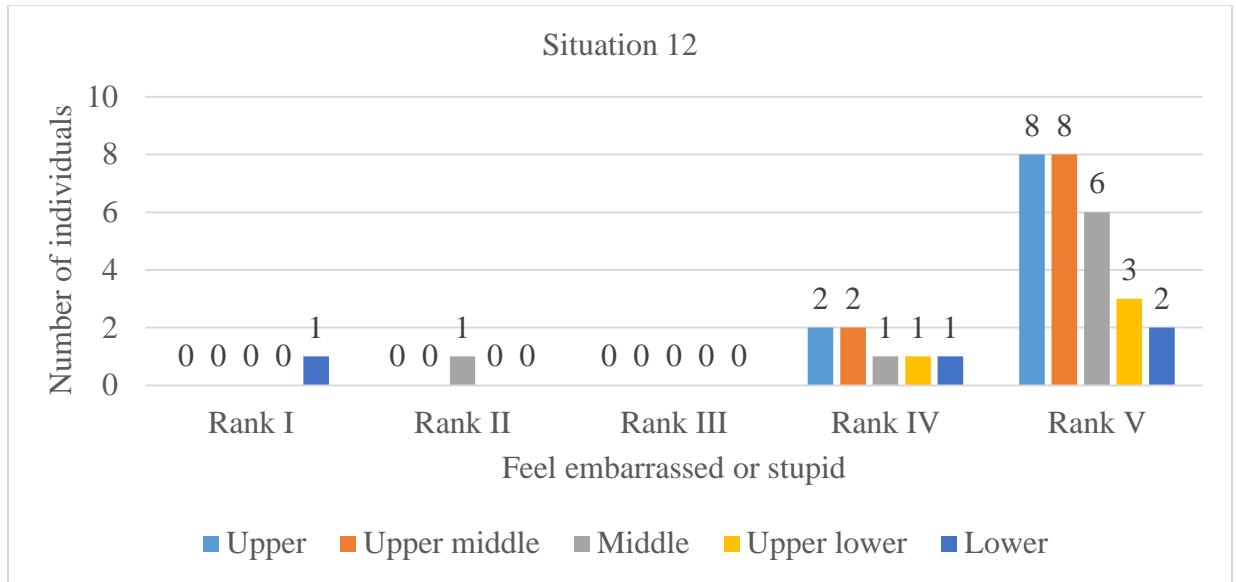


Figure: 4.12 Frequency distribution for Communication situation 12 (Feel embarrassed or stupid) in number of individuals.

4.13 Communication situation 13

The 13th communication situation is feeling left out (figure 4.13). Only 7 out of all participants gave ranks to this. It was only lower SES which gave 3rd, 4th, 5th ranks. Results show that only 3.5% of all participants have assigned as either 4th or 5th priority to this. This is indication that situation of feeling left out is not an important communication need for all. Only participants from lower SES have ranked this. This could be due to lack of awareness or myths and misconceptions about hearing loss. Common belief among people is hearing impairment is indicator of ageing and frailty (Stark, P., & Hickson, L. 2004). If a person fails to listen or communicate properly he or she might be avoided from hiring especially in unorganized sectors such as construction, labor works etc., where this impairment interferes with working ability of individual. Hence chances of separating the hearing impaired as being lower SES can be justified.

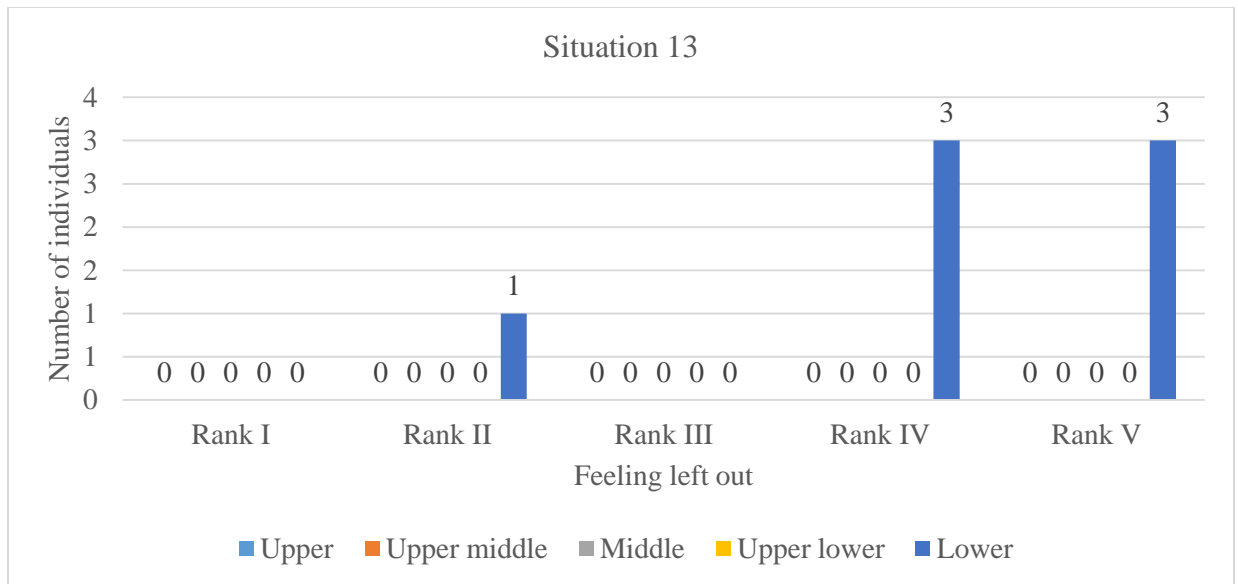


Figure: 4.13 Frequency distribution for Communication situation 13 (Feeling left out) in number of individuals.

4.14 Communication situation 14

The 14th communication situation is feeling upset or angry (figure 4.14). Total of 16 individuals out of all participants ranked this option. Upper and upper middle SES equally ranked this as their second priority. Only lower SES ranked as 3rd. The order of SES which assigned 5th rank is upper lower > lower > upper middle and middle > upper. As only 8% of total population ranked this and majority of them have ranked as 5th priority, this can be considered as not an important communication situation. Among those ranked as 5th majority are from upper lower and lower SES. This might be due to lack of awareness, access to treatment, higher incidences of feeling left out, reduced social contact are due to hearing difficulties in them.

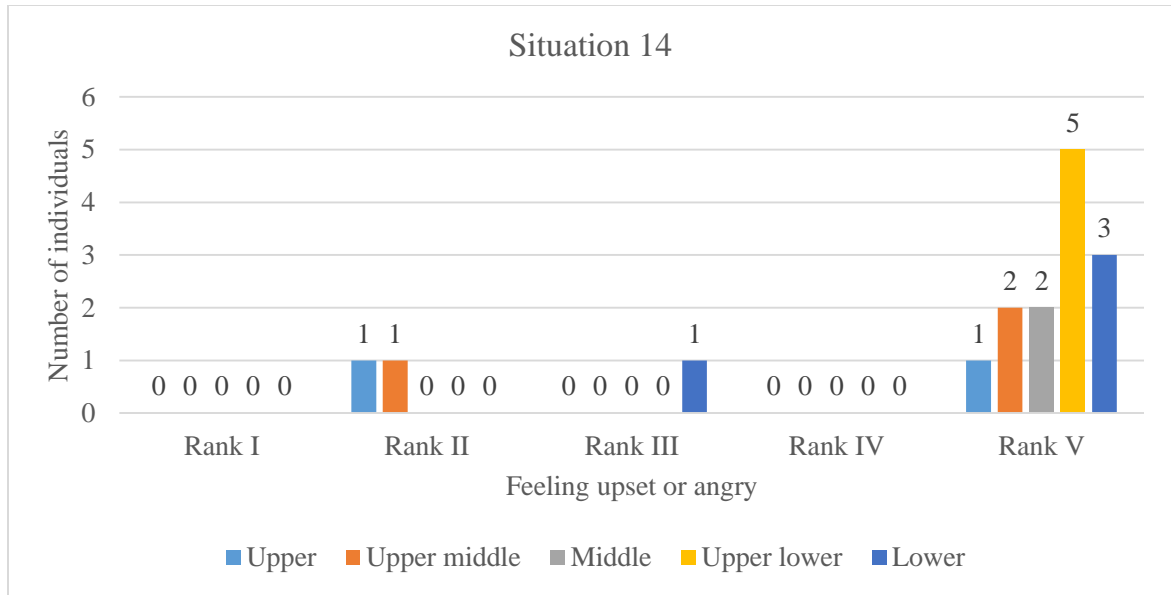


Figure: 4.14 Frequency distribution for Communication situation 14 (Feeling upset or angry) in number of individuals.

4.15 Communication situation 15

The 15th communication situation is listening in church or meeting (figure 4.15). Total 7 individuals out of all participants ranked this. Among them 100% ranked it as 5th of which 14.3% were upper and upper lower, 28.6% were upper middle, 42.9% were middle SES. None of the lower SES participants gave any rank to this communication situation. Order of SES which ranked this as 5th is Middle > upper middle > upper and upper lower with equal shares. Only 3.5% have assigned a rank to this which infers that this is not a major listening situation in demand. Of these majority are from lower SES. All SES have ranked as their last priority, constituting lower half of SES as major share.

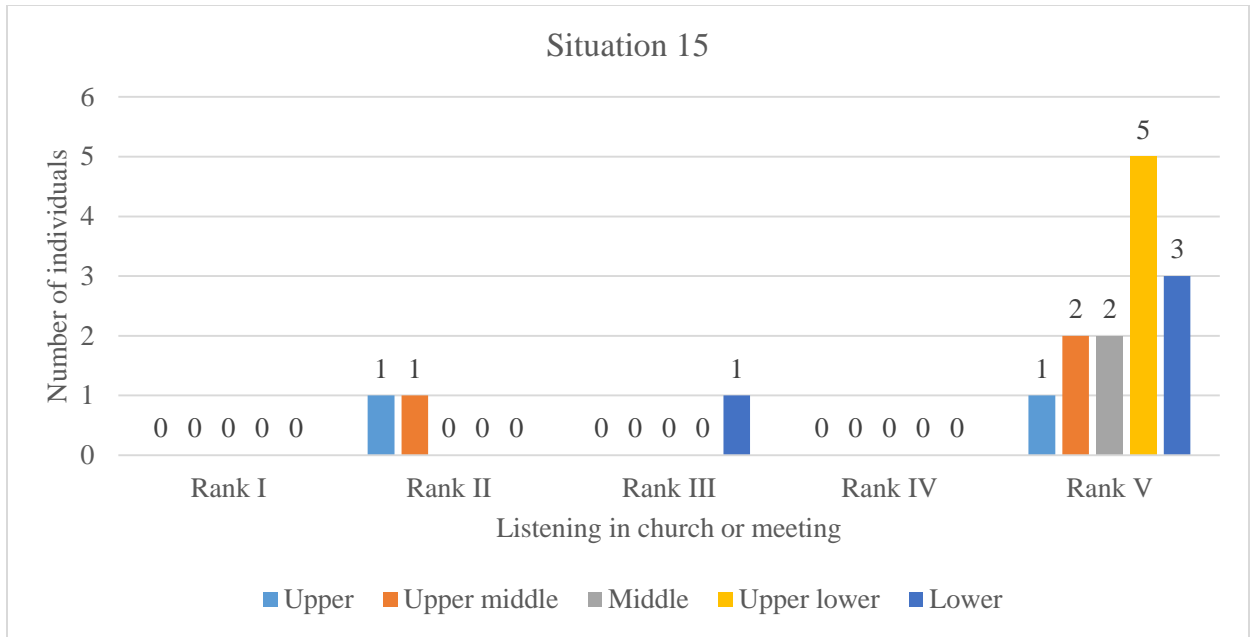


Figure: 4.15 Frequency distribution for Communication situation 15 (Listening in church or meeting) in number of individuals.

4.16 Communication situation 16

The 16th communication situation is any other situation which the participants found important. None of the individuals opted this. None of participants have reported any other situation which they think as important. This also indicates that COSI is successful in covering all important and essential listening and communication situations.

ii. Association of socio economic strata on outcomes of the hearing aids

4.17 Question 1

This question addresses about the number of hearing aids individual is using (figure 4.17). In Upper strata majority of the participants were binaural hearing aid users (38%) and Majority of the lower economic strata were monaural hearing aid users (27.5%). There was significant association ($p < 0.05$) between SES and number of hearing aids the individuals used.

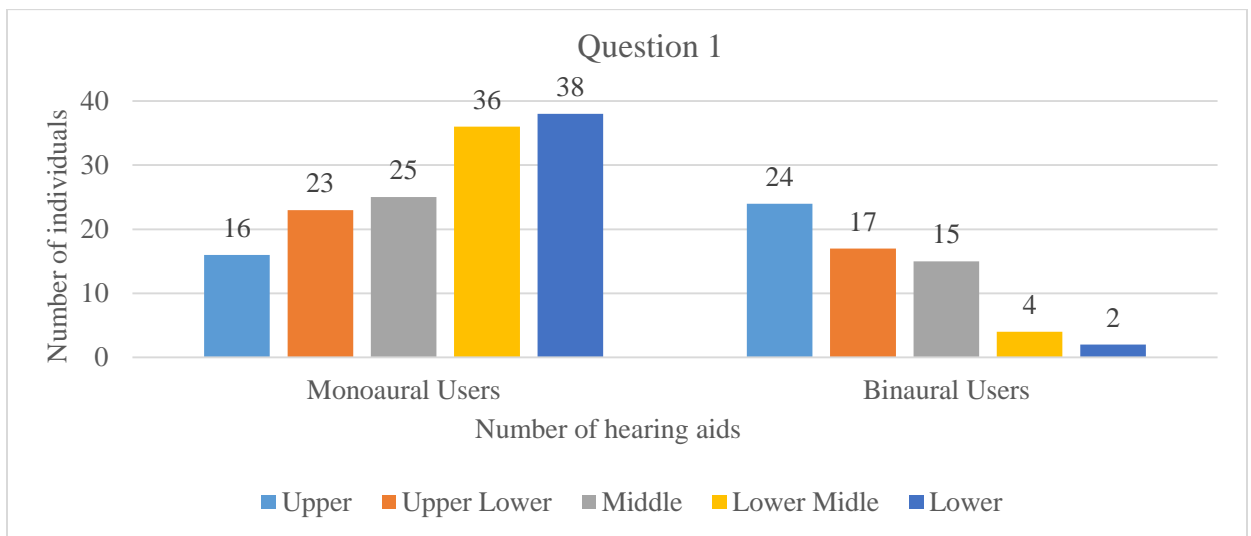


Figure: 4.17 Frequency distribution for Question 1 (Number of hearing aids) in number of individuals.

As reported by Kochkin and Kuk (1997) there was a strong “directionality” effect in favour of binaural fittings, enhanced enjoyment in outdoor environments and improved benefit (as measured by APHAB). High performance hearing instruments demonstrated a stronger binaural advantage in sound quality and in multiple listening situations. William Noble (2006) concluded that, with reference to key contrasts between laboratory and real-

world listening, hearing impaired prefer a bilateral prescription for the management of disabilities. Noble and Gatehouse (2006) found that it was in more challenging speech hearing contexts (multi-stream and rapidly switching speech streams) that two hearing aids could be observed to offer additional self-rated benefit over one. The present study results have shown that binaural hearing aid users were more in upper SES (38%) which can be related to higher levels of income. Garstecki and Erler (1998) found that the level of income and satisfaction was greater among those who are adherent to the use of hearing aid than those who are not adherent to use of hearing aids. Stuart Gatehouse (1994) in his study on Components and Determinants of Hearing Aid Benefit had mentioned that Socio economic status is an important parameter in determining the outcomes of hearing aid and he had observed that SES had a positive correlation with satisfaction (Ching T V et al 2006). Binaural hearing aids are always found to be more beneficial than monaural hearing aids.

4.18 Question 2

This question reports about number of hours the individual is using hearing aid (figure 4.18). 72% of participants used hearing aids for more than 8 hours per day. 70% of upper SES and middle SES, 80% of upper middle SES, 75% of upper lower SES and 65% of lower SES used more than 8 hours per day. 22% of participants used for 4 to 8 hours per day. 22.5% of upper SES and middle SES, 15% of upper middle SES, 22.5% of middle SES and 25% of upper lower SES and lower SES used for 4 to 8 hours per day. Only 6% of participants used their hearing aids for 1 to 4 hours per day. 7.5% of upper SES and middle SES, 5% of upper middle, 10% of lower SES used their hearing aids for 1-4 hours per day. There was no significant association between SES and number of hours the hearing aids were used by the individuals per day ($p > 0.05$). Regardless of insignificance among

those who used 4-8 hours/day number of upper lower & lower SES were slightly higher. This could be due to differences in their daily activities, socio economic activities. Majority of lower levels of SES are involved in agriculture and unorganized sectors such as construction works, as labors, sanitation and civil works etc. Perhaps it becomes uncomfortable for users to use hearing aids at work especially in physical labor is involved.

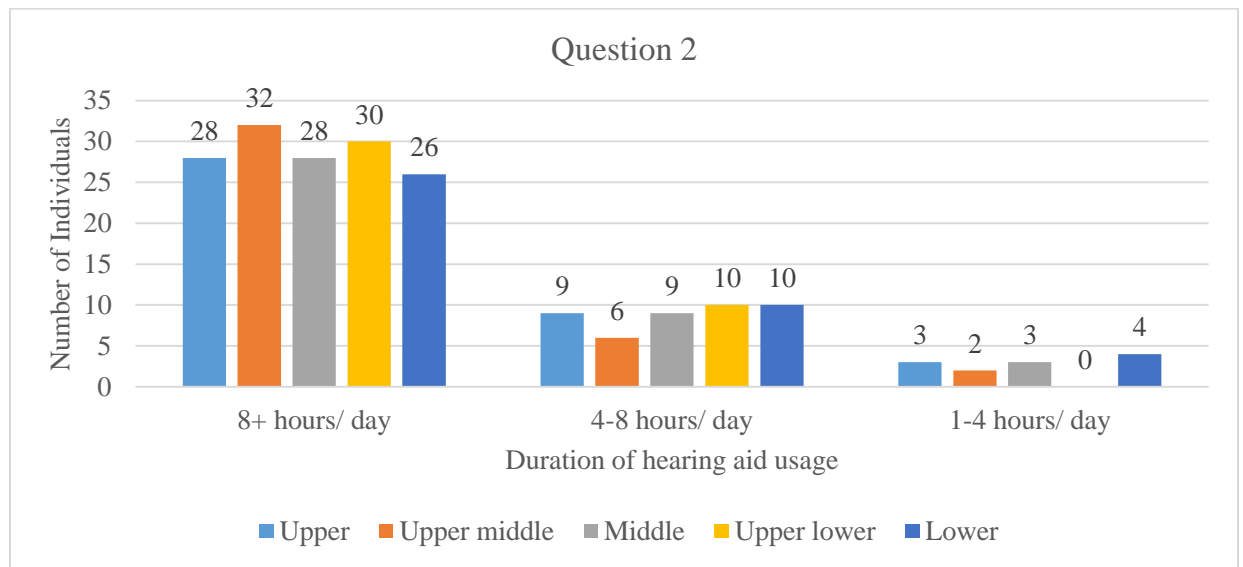


Figure: 4.18 Frequency distribution for Question 2 (Number of hours) in number of individuals.

As reported by Schum (1992) degree of hearing loss, hearing aid style or hearing aid experience did not influence the satisfaction levels but it was influenced by the number of hours per week the hearing aid was used. Cox (2003) has reported that the use time is an indicator of real world hearing aid outcome. More the time a person uses hearing aid, more he will be helped in the worst listening situations which thereby inspires him to wear it for longer time. Even though there is no association between SES and duration of hearing aid use per day, the duration is an important factor affecting the satisfaction and benefit of

hearing aid/s. In this current study 72% of participants used hearing aids for more than 8 hours a day. There is no association between SES and the number of hours for which the hearing aid/s were used. Irrespective of SES participants used hearing aid/s for more than 8 hours a day which is directly related to satisfaction and benefit. Gearstick and Erler (1998) found that the level of income satisfaction was greater among those who are adherent to hearing aid use than those who are not adherent to hearing aids use.

4.19 Question 3

This question reports about help obtained from hearing aids to listen in different listening situations. There are total 16 listening situations in which the individual has to rank 5 listening situations in the order of significance.

4.19a Question 3.1

First situation reports about how well hearing aids are benefiting the person in family communication (figure 4.19a). 39.5% of the population rated their hearing aids to be helping them a lot of times. 45% of upper SES, 47.5% of upper middle SES, 50% of middle SES, 22.5% of upper lower SES and 32.5% of lower SES reported to be useful a lot of times. 51.5% of total population reported that their hearing aids helped them a few times. 45% of upper SES, upper middle SES, middle SES reported a little help, 62.5% of upper lower and 60% of lower SES reported a little help. 9% of participants reported no help from their hearing aids. 10% of upper SES, 7.5% of upper middle SES, 20% of upper lower SES and 7.5% of lower SES reported not at all help from hearing aids. The SES had no significant association with benefit of hearing aids in family situation ($p>0.05$). The results of the present study indicate that irrespective of SES for more than 75% of

population hearing aids have helped at least 2/3 of times and none have reported as no help required. It can be inferred from this, that hearing aids have considerable amounts of benefits to the hearing impaired individuals. It was observed that socio economic status was not related to outcomes and satisfaction of hearing aid users (Gatehouse, 1994; Norman et al., 1994; Hickson et al., 1999; Jerram and Purdy, 2001). Neither the status of user's employment (not employed, part time, and full time) contributed to satisfaction and outcomes significantly nor the socio economic status (Jerram and Purdy, 2001).

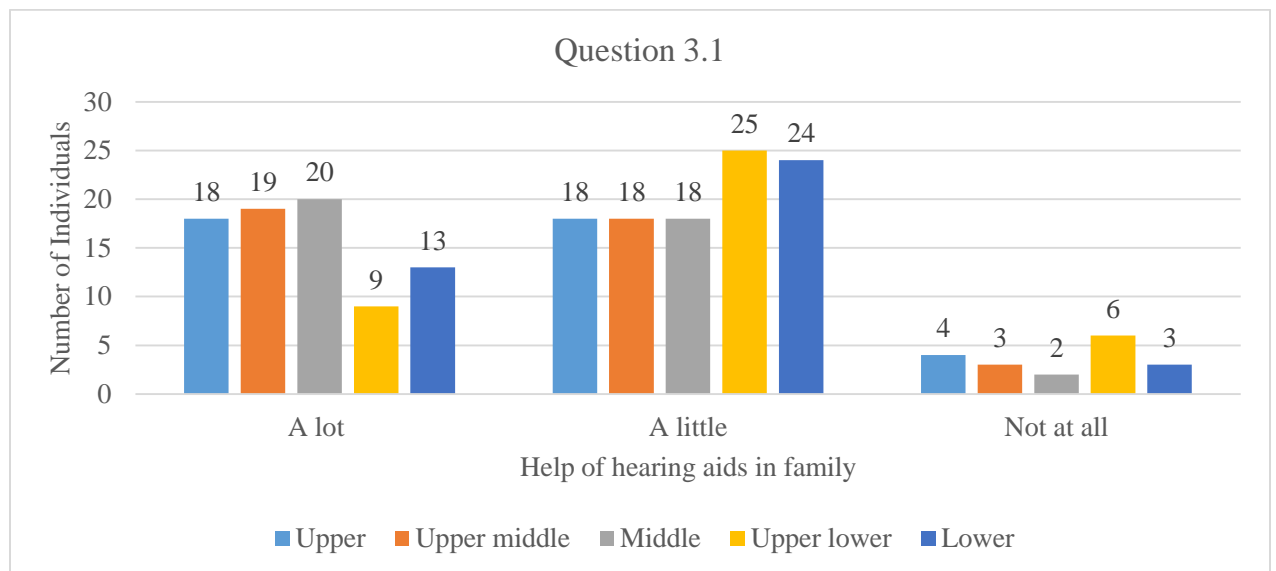


Figure: 4.19a Frequency distribution for Question 3.1 (Help from hearing aids in family situations) in number of individuals.

4.19b Question 3.2

This question describes the help of hearing aids in small group conversations (figure 4.19b). 20.5% of participants indicated that their hearing aids of helped a lot times. 10% of upper SES, 7.5% of upper middle, 17.5% of middle SES, 25% of upper lower SES, 42.5% of lower SES reported help for lot of times. 63% of participants reported that their

hearing aids d them a little. 70% of upper SES, 67.5% of upper middle and middle SES, 60% of upper lower SES and 50% of lower SES reported help as few times. 16.5% of all participants rated help from hearing aids in this situation as not at all helpful. 20% of upper SES, 25% of upper middle, 15% of middle and upper lower, 7.5% of lower reported help as not at all helpful. Association of SES with the above mentioned situation is significant and lower SES have rated their hearing aids to be of significantly greater help than upper SES ($p < 0.05$). Larger number of participants from lower SES have rated their hearing aids to be more helpful than higher SES. Lesser awareness among lower classes of SES which in turn affects the developed expectations, due to fewer expectations people from lower classes of SES might have rated their hearing aids to be more helpful. Higher SES have better awareness and thereby higher expectations from hearing aids. Majority of higher SES are found to be working in white collar jobs which demands more listening and need of communicating in multi speaker condition. Situations such as official meetings, banking, meeting other colleagues and increased social interaction can be more seen in people from higher SES. These situation demands more efforts in listening than in situations like chatting with friends, small market, shops unorganized work places, agriculture where listening demands are lesser.

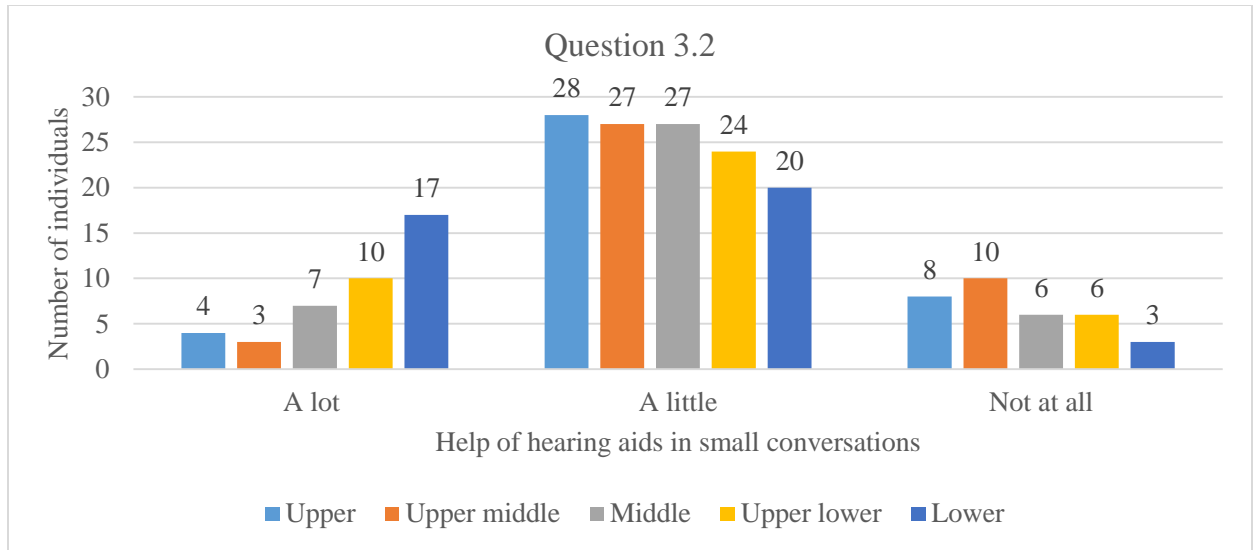


Figure: 4.19b Frequency distribution for Question 3.2 (Help from hearing aids in small conversations) in number of individuals.

4.19c Question 3.3

This question indicates the help of hearing aids in situations such as meetings in committee, temples or church gatherings (figure 4.19c). 11% of participants have reported their hearing aids to be of greater help at a lot times. 12.5% of upper lower and 22.5% of lower have rated help as a lot times. 70.5% of participants have reported the help from hearing aids as helpful at a little times. 67.5% of upper and upper lower SES, 70% of upper middle, 75% of middle and 72% of lower SES reported as helpful at a little times. 18.5% of total population have reported that their hearing aids were not at all of help in this situation. 25% of upper and upper middle, 17.5% of middle and 20% of upper lower reported the same. There is no significant association between SES and help from hearing aids in this situation ($p>0.05$).

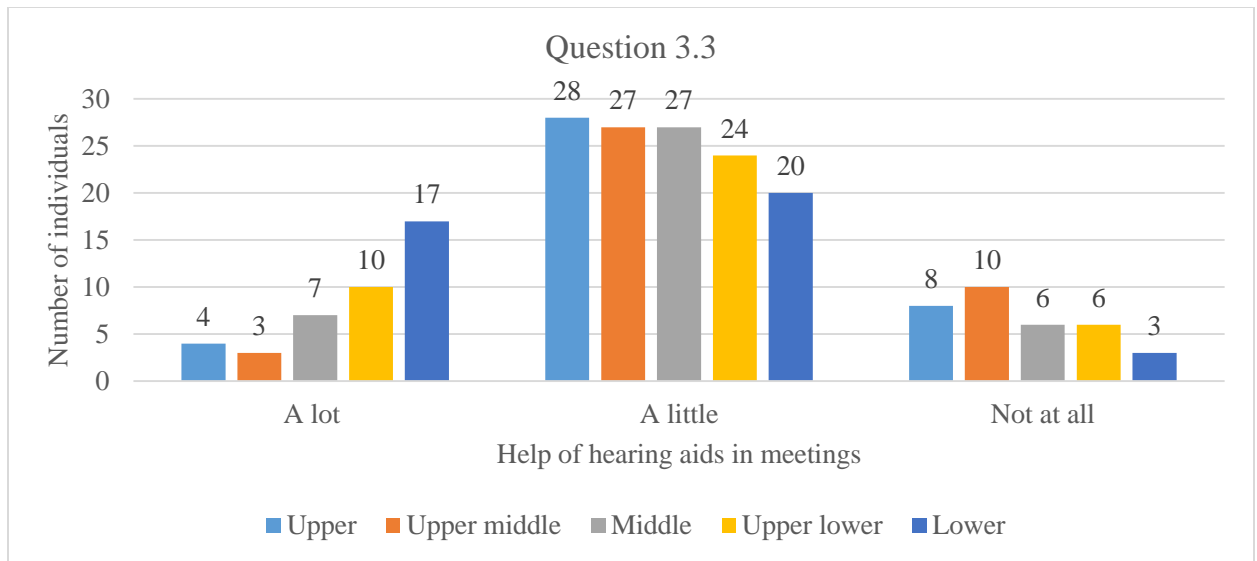


Figure: 4.19c Frequency distribution for Question 3.3 (Help from hearing aids in meetings) in number of individuals.

There was no association between SES and help of hearing aid/s in situations such as meetings in committee, temple or church gatherings. However, 11% of the participants reported that hearing aid/s helped a lot and 70.5% reported as a little help. 63% of participants have rated the use of hearing aids as useful a little times this leads us to state that the hearing aids have found to be delivering the benefits to user. Nevertheless of lower significance, in rating as a lot time helpful people from lower SES, have major share, higher SES doesn't seem to be obtaining maximum help from their hearing aids. In rating help as a little all top three SES have rated with same proportion, as more number of upper lower & lower SES have rated a lot their share is pretty less here. A little proportion of higher SESs have rated as not helpful where only a few from lower SES have rated as so. People of higher SES are more exposed to meetings such as in office, social gatherings and their socio economic activities etc. They might have higher expectations from their hearing aids than that of people form lower SES who encounter less of these situations. Perhaps people

of higher SES are not very satisfied with the performances of their hearing aids. These differences in expectations and situations where they work or live could have influenced the ways in which participants have rated.

4.19d Question 3.4

This question deals with help from hearing aids in social activities such as shopping, playing etc. (figure 4.2.3d) Statistical analysis shows that 7.5% of the participants have reported their hearing aids to be helpful a lot times. 10% of upper middle and middle, 12.5% of upper lower SES reported their hearing aids to be helpful a lot of times. 69% total participants have reported their hearing aids to be helpful a little times. 67.5% of upper SES, 75% of upper middle SES, 70% of middle SES, 60% of upper lower and 72.5% of lower SES reported help to be a little times. 23.5% of participants have rated help as not at all. 30% of upper SES, 15% of upper middle SES, 20% of middle SES, 27.5% of upper lower SES and 25% of lower SES have reported help as not at all. There is no significant association between SES and help from hearing aids in above mentioned situation ($p>0.05$).

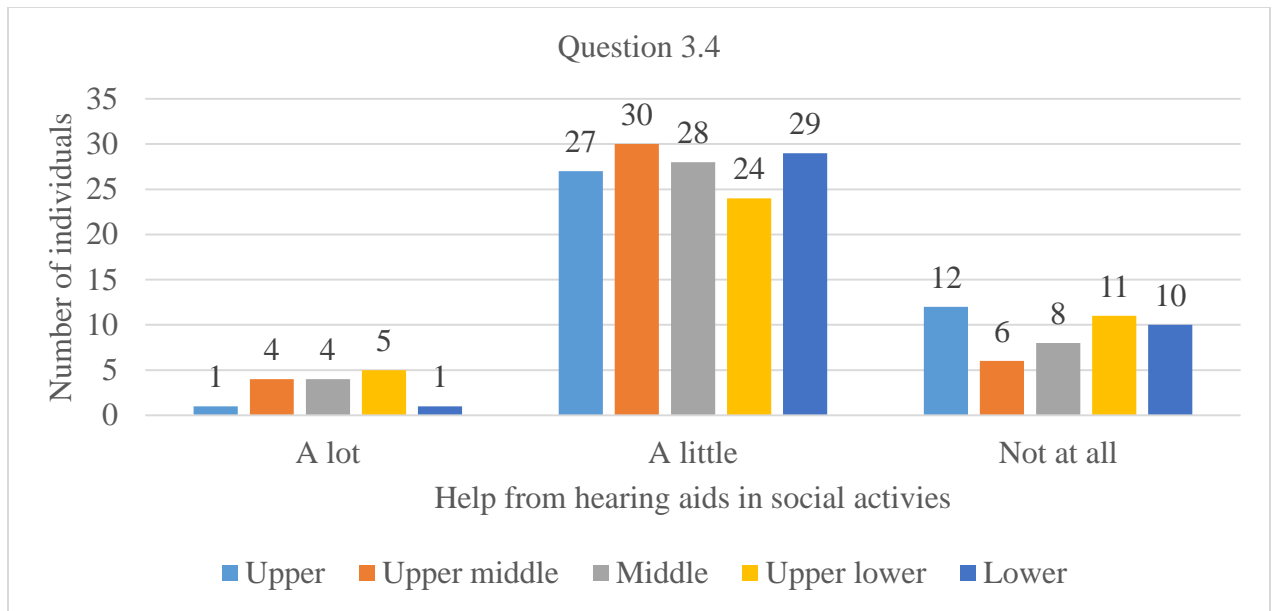


Figure: 4.19d Frequency distribution for Question 3.4 (Help from hearing aids in social activities) in number of individuals.

69% of the participants reported as a little help whereas 23.5% reported as not at all helpful. As there was no association between SES and help from hearing aid/s in social activities the hearing aids have found to be benefitting all users irrespective of their SES. Number of people who have rated help as a little or lot are almost same across all SES which indicates that the present situation is required and faced by participants from all SES. There are also a little variations seen in population rating as not at all helpful, lesser number of upper middle and middle SES compared to other SES which have rated with equal proportions. This infers that hearing aids of these SES are not found to be doing well. As expected social activities involves multi talker or noisy conditions activities such as shopping, playing or functions can never be occurring in quiet conditions and this is common across all SES.

4.19e Question 3.5

This question reports about the help from hearing aids in watching television or listening to radio, music etc. (figure 4.19e). 14.5% of the study population have rated the help by hearing aids in this situation as a lot time and 22.5% from upper SES, 32.5% from upper middle SES, 7.5% from middle and upper lower SES, 2.5% from lower SES have rated the same. 66% of whole population reported to benefit little times, 47.5% of upper SES, 55% of upper middle SES, 75% of middle and upper lower SES, 77.5% of lower SES have reported the same help. 19.5% of the total participants have reported the help from their hearing aids as not at all times. 30% of upper SES, 12.5% of upper middle, 17.5% of middle and upper lower, 20% of lower SES have said not at all helpful. There is significant association between SES and help from hearing aids in this situation ($p < 0.05$). The majority opted little help where upper SES and upper middle SES obtained significantly lesser help than middle, upper lower and lower SES the association of SES with help from hearing aids was significant.

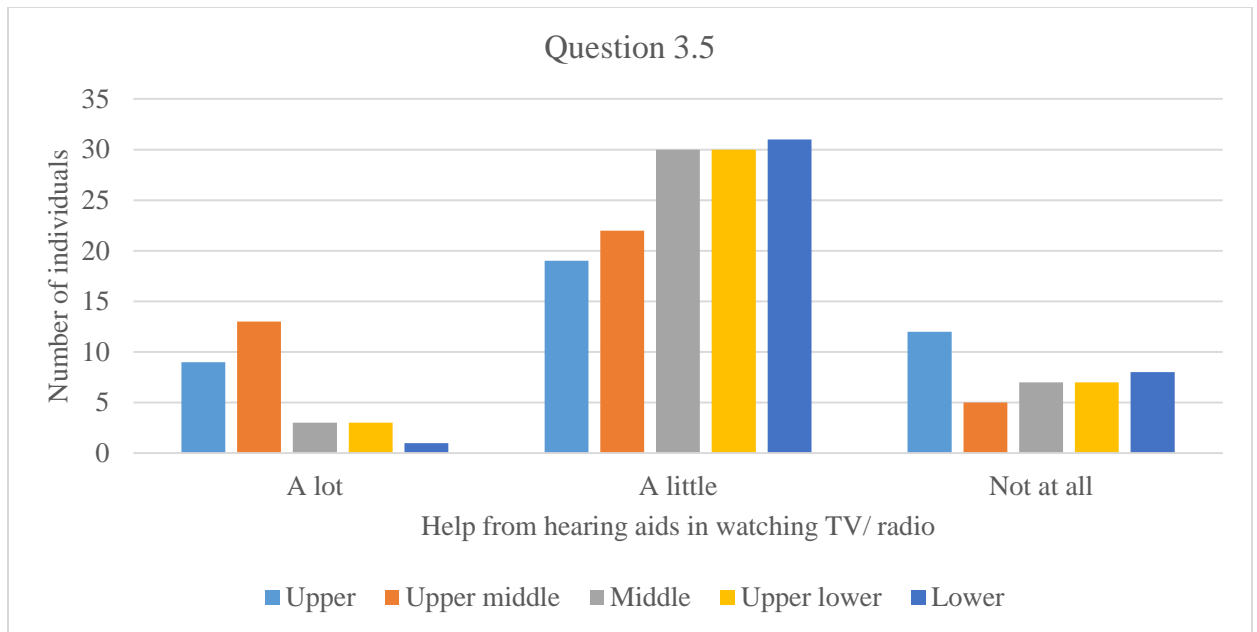


Figure: 4.19e Frequency distribution for Question 3.5 (Help from hearing aids in social activities) in number of individuals.

Watching TV or listening to radio is an act required by people of all SES, it is seen that more number of people from higher SES have rated help as a lot and more number of people from lower half of SES have rated as a little times. These differences could be due to the differences in quality of living, living standards which are pretty high among higher SES. It is easy to watch TV in a silent room with better TV quality and speaker systems than watching in a room which has no proper ceiling, has crowd surrounding it, with lower quality of TV or speakers. These sophisticated features can be easily afforded by people of upper SES. In rating not at all useful people of upper SES have upper hand, this could be due to higher expectations from hearing aids.

4.19f Question 6

This question describes about help from hearing aids in speaking over telephone or cell phones (figure 4.19f). 11% of the participants have reported the help as a lot of times. 27.5% of upper SES and 12.5% of upper middle SES have also rated the same. 68% of participants rated help as little times. 42.5% of upper SES, 70% of upper middle SES, 75% of middle SES, 77.5% of upper lower SES and lower upper SES rated help to be a little times. Among all participants 20.5% have reported the help from their hearing aids to be not at all times and also 30% of upper SES reported the same. There is significant association of SES with help of hearing aids in listening over telephones where hearing aids were significantly lesser helpful to upper than other SES ($p < 0.05$). People from higher SES have more awareness, education and higher access to internet (Wangberg, S. C, et al, 2008; Khan, A. S. et al 2016) for information. People of privileged SES can afford with greater ease to search over internet (Wangberg, S. C, et al, 2008; Khan, A. S. et al 2016) or seek information from concerned person. This increases their knowledge about ways and possibilities to reduce the hearing difficulties which increases their expectations. Perhaps because of these expectations people of upper SES might not be satisfied with the help from hearing aids. In contrast people of lower SES have lesser awareness and can't afford to seek much knowledge from other sources, thereby limiting their expectations which results in more satisfaction. Cell phones are more prevalent in people of privileged SES (Blumenstock, J., & Eagle, N, 2010). Communication over telephones, mobiles or situations such as attending to tele conferences are majorly found in higher SES, this could be one of their primary daily activities. This can be due to increased social contacts or workplace demands where communication over phones are integral part of their work e.g.,

a managers, officers, software engineers, receptionist etc., are bound to communicate over cell phones than a labor, factory worker, farmer, vegetable seller etc.

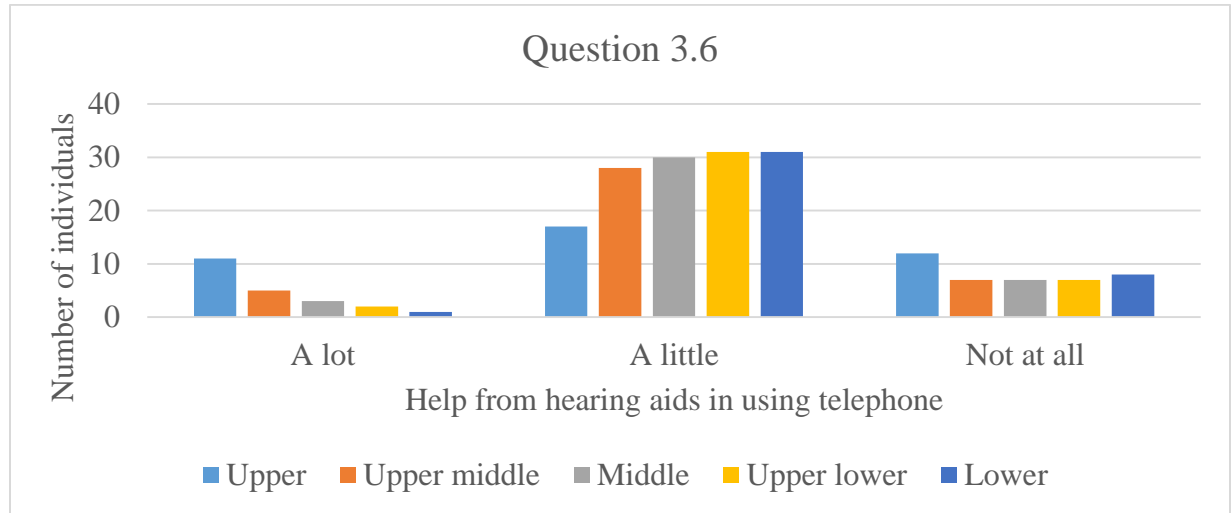


Figure: 4.19f Frequency distribution for Question 3.6 (Help from hearing aids in using telephone) in number of individuals.

With respect to the use of telephones, upper SES had less benefit. This can be attributed to more usage of telephone and the challenging situations they face. 20.5% of total participants said not at all helpful which indicates the need of more fine tuning and programming the hearing aid parameter meticulously. This also indicates further involvement of hearing aid algorithms to help hearing aid user to benefit more in using telephone.

4.20 Question 4

This question deals with various kinds of difficulties experienced by hearing aid users. There are seven different kinds of difficulties often faced by hearing aid user.

4.20a Question 4.1

Frist question reports about presence of difficulties faced by user in positioning and removing the hearing aid (figure 4.20a). 2.5% of total population had difficulty in this situation. 7.5% of middle SES and 5% were from lower SES. 97.5 of the participants had no problem in placing and removing the hearing aids. There was no significant association between SES and ease of placing and removing hearing aids ($p>0.05$).

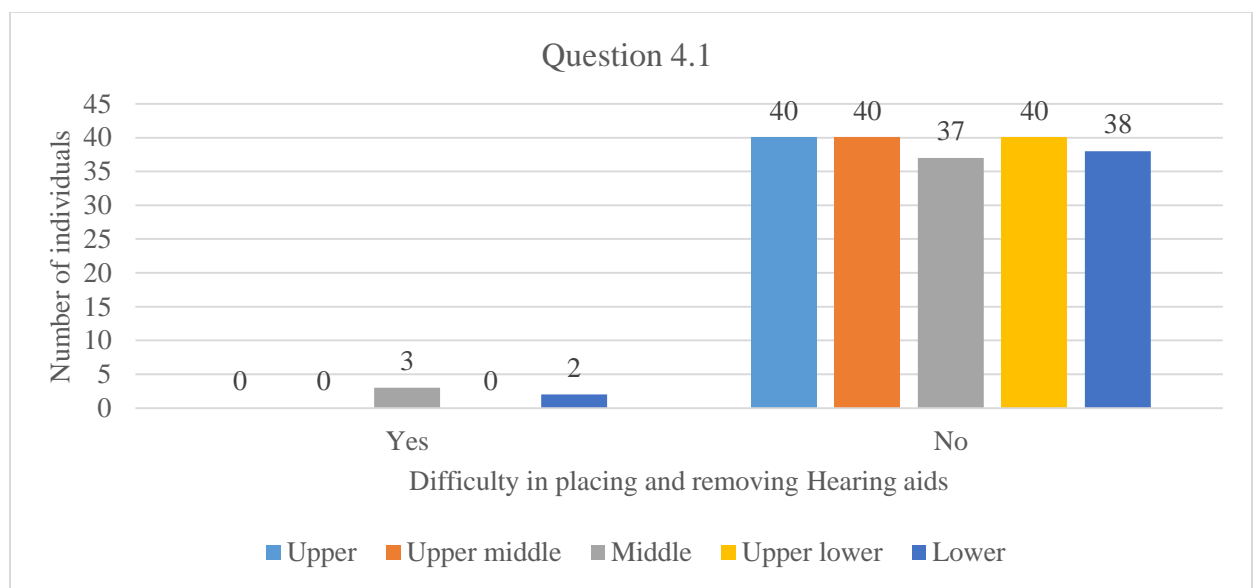


Figure: 4.20a Frequency distribution for Question 4.1 (Difficulty in placing & removing hearing aids) in number of individuals.

Results show only 5% of participants had difficulty in placing and removing hearing aid/s. 95% had no difficulty which can be attributed to effective counselling by the audiologist and individual variations. All participants had equal knowledge about placing and removing hearing aids irrespective of their SES. This could have been possible due to effective training and counselling by their audiologists. Proper counselling reduces the difficulties faced by users in using hearing aids (Ishu M, 2016)

4.20b Question 4.2

This question reports any difficulty in adjusting the controls of the hearing aids (figure 4.20b). Results of statistical analysis have shown that 93% of total population had no difficulty in adjusting the controls of the hearing aids. 7% of participants had difficulty in adjusting the controls of hearing aids. 15% of upper lower SES and 17.5% of lower SES had difficulties in doing this task. There was no significant association between SES and ease of adjusting the controls of hearing aids ($p>0.05$).

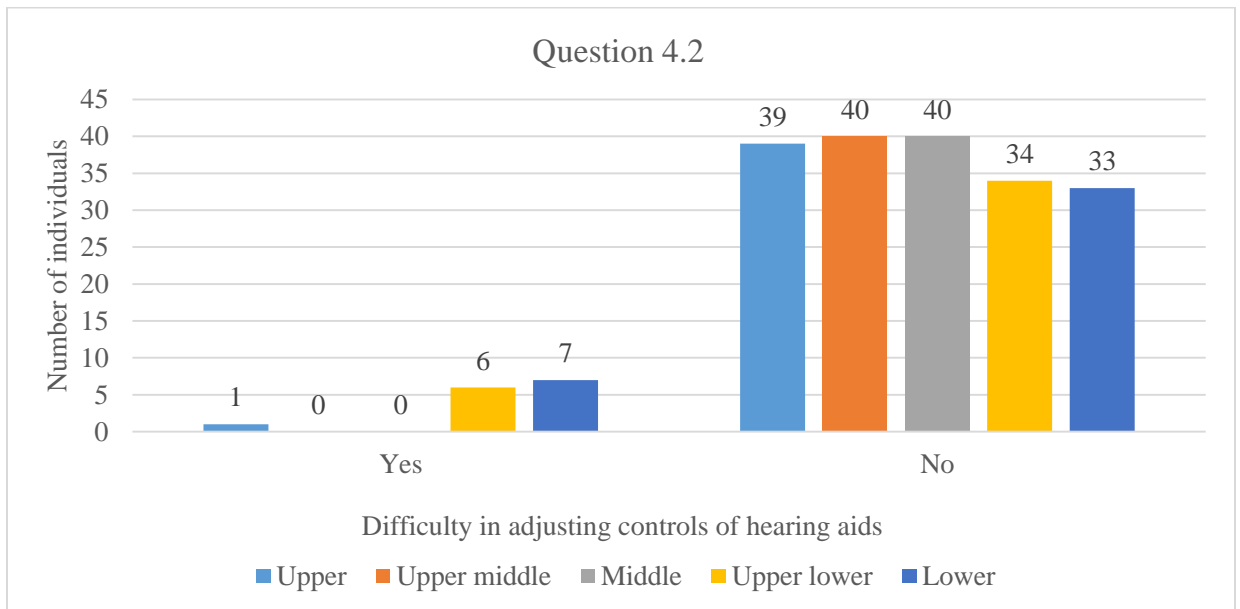


Figure: .4.20b Frequency distribution for Question 4.2 (Difficulty in adjusting controls of hearing aids) in number of individuals.

Results show that upper lower and lower SES participants had difficulty in adjusting the controls of hearing aid/s. This can be correlated with the lack of education level and exposure to usage of other electrical devices and less awareness (Yucel et al, 2008) among people of lower SES. This could be rectified through effective counselling by the audiologists (Ishu M, 2016).

4.20c Question 4.3

This question addresses about squealing of hearing aids when placed in the ear and set at comfortable levels that is when not set at very high levels (figure 4.20c). Results are indicating that 87% of total participants had no whistling or squealing in their hearing aids when placed in the ears and set at comfortable levels. 11.5% of upper and middle SES, 10% of upper middle and 20% of upper lower and lower SES 20% reported positively for the presence of problem. Squealing or whistling had no significant association with SES ($p>0.05$). Whistling have affected many of hearing aid users irrespective of their SES. Of all participants 13% of people have reported the presence of squealing or whistling, this could be because of lack of finer adjustments in ear mould, programming or technical limitations of hearing aids. Results point out that the number of participants with present whistling problem are more from upper lower and lower SES than other strata. This could be due to difficulty of people of lower SES to procure higher end hearing aids which have better feedback cancellation algorithms. A small number of higher SES also have reported problem which could be due to individual variations in moulds or programming which can be rectified by audiologists.

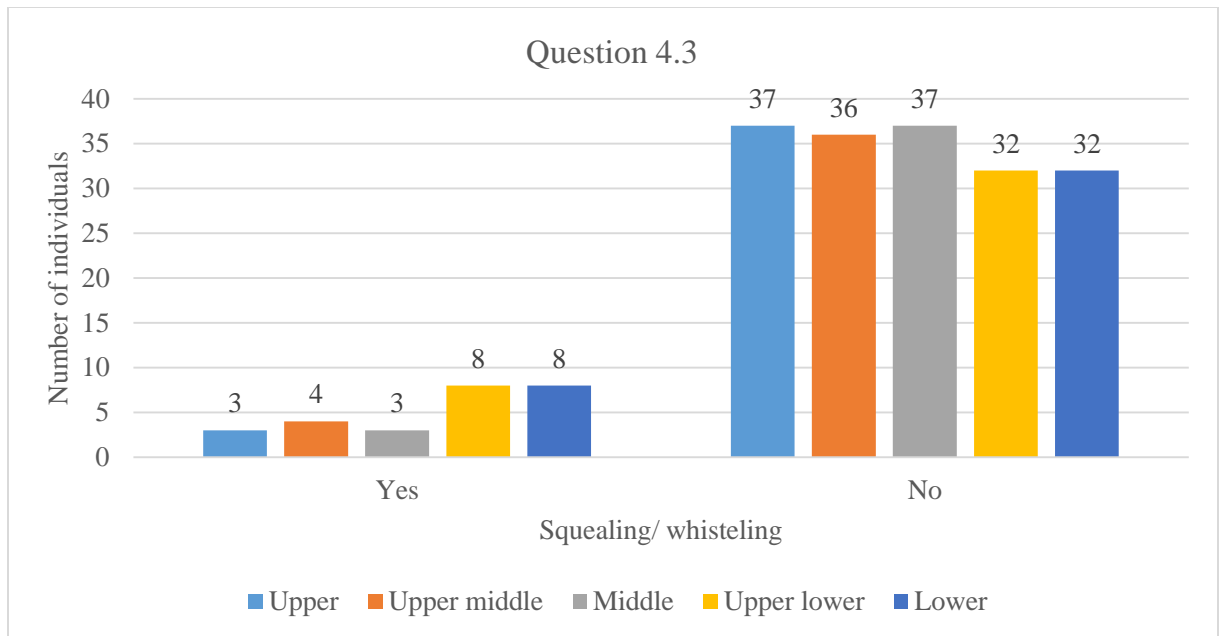


Figure: 4.20c Frequency distribution for Question 4.3 (Whistling problem) in number of individuals.

4.20d Question 4.4

This question reports about the discomfort in the ear due to fit of hearing aids or ear mould (figure 4.20d). Only 14.5% of the total population have reported discomfort. In upper middle, middle and upper lower SES 17.5% of participants reported whistling to be present. 85.5% of total population did not report any discomfort. There was no significant association of SES with discomfort caused by fit of hearing aids or ear moulds ($p > 0.05$).

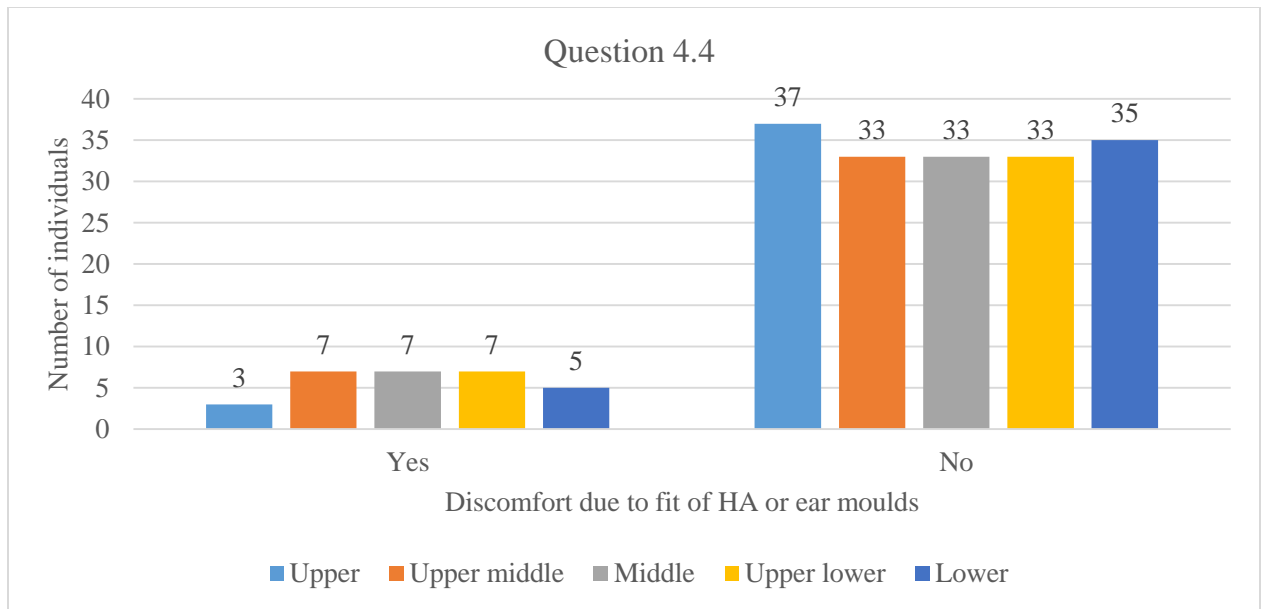


Figure: 4.20d Frequency distribution for Question 4.4 (Discomfort due to fit) in number of individuals.

Results show that only 14.5 % of participants had discomfort due to fit of hearing aid/s or ear mould. During data collection it was observed that the discomfort reported was more due to ear moulds rather than hearing aid. There is no SES wise association among participants and this problem. This could have been due to minor mistakes in the process of making ear moulds or impression taking. This can be solved by ear mould technician. Some individuals may feel discomfort despite proper ear moulds which can be due to individual variations. SES has got nothing to do with this problem.

4.20e Question 4.5

This question says whether hearing aids make any sudden unbearably loud noises (figure 4.20e). This problem was seen only in 5% of the total population. 7.5% of upper middle and upper lower reported the presence of problem in their hearing aids. 95% of

participants reported no such problem. There was no significant association of SES with the above mentioned problem ($p>0.05$).

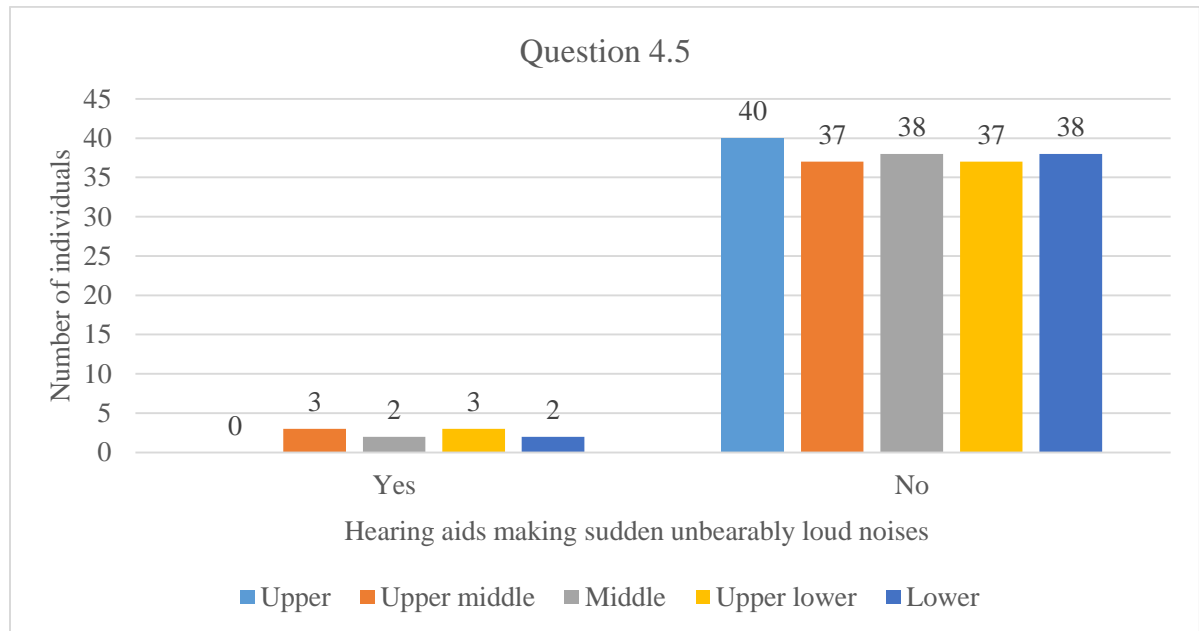


Figure: 4.20e Frequency distribution for Question 4.5 (Hearing aids making sudden unbearably loud noises) in number of individuals.

It's seen that only 5% reported that their hearing aid/s made sudden unbearably loud noises even when kept at normal volume setting this can be related to the different environment the individual is exposed to, which indicates that problem could have been to the differences in skills of audiologists who had programmed or due to individual variations among users. Maximum power output and peak clipping makes sure that sudden very loud sounds are restricted to acceptable lower levels. All present day hearing aids have these features as a measure of safety. Chances of effect of surrounding environment cannot be rejected. Noises such as traffic noise, social noise or construction noises are quite common

across all individuals irrespective of SES. Finer tuning by audiologists can resolve the problem.

4.20f Question 4.6

This question describes the quality of their own voice coming from the hearing aids as echoing or feels hollow which happens due to high emphasis to lower frequencies (figure 4.20f). Only 7.5% of the total population reported to be feeling their own voice as hollow or echoing. 7.5% of upper SES, middle SES and upper lower SES said that they have this problem. 10% of lower SES also reported the same. 92.5% of the total population did not report any issues with their own voice quality. There was no significant association seen among SES and above mentioned problem ($p > 0.05$).

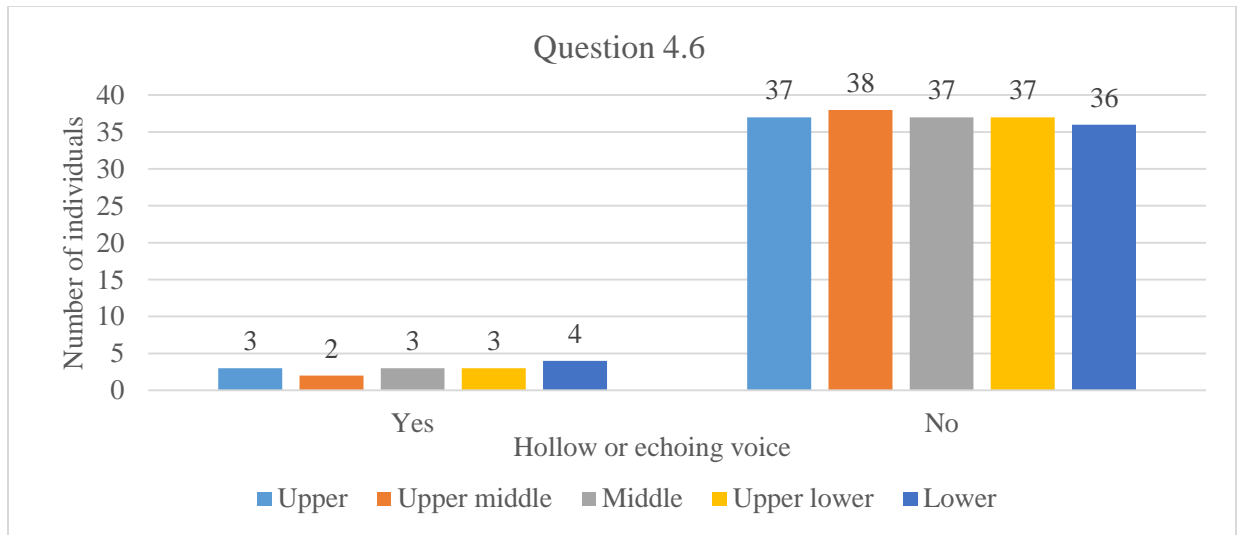


Figure: 4.20f Frequency distribution for Question 4.6 (Hollow or echoing voice) in number of individuals.

From the results it's seen that 92.5% of the total population did not report any issues with their own voice quality, only 7.5% reported the sound was hollow or echoing. The

problem of feeling hollow is not differentially present across all SES which is shown by insignificant association of SES in the results. Its only minor portion of participants who have reported the problem which could be due to individual differences in expectation and perception of amplified sound. Variations in programming by audiologists can also contribute in this regard.

4.20g Question 4.7

This question describes if other people are helping to adjust hearing aids or not (figure 4.20g). Results indicated that for 6% of total population seek help from others to adjust their hearing aids of this there were none of upper SES, 2.5% of upper middle SES, 10% of middle, 7.5% of upper lower and 10% of lower. 94% of the participants did not get any help from others. There was no significant association between SES and help extended by others in adjusting hearing aids ($p>0.05$). Irrespective of SES people helped users to adjust to adjust their hearing aids.

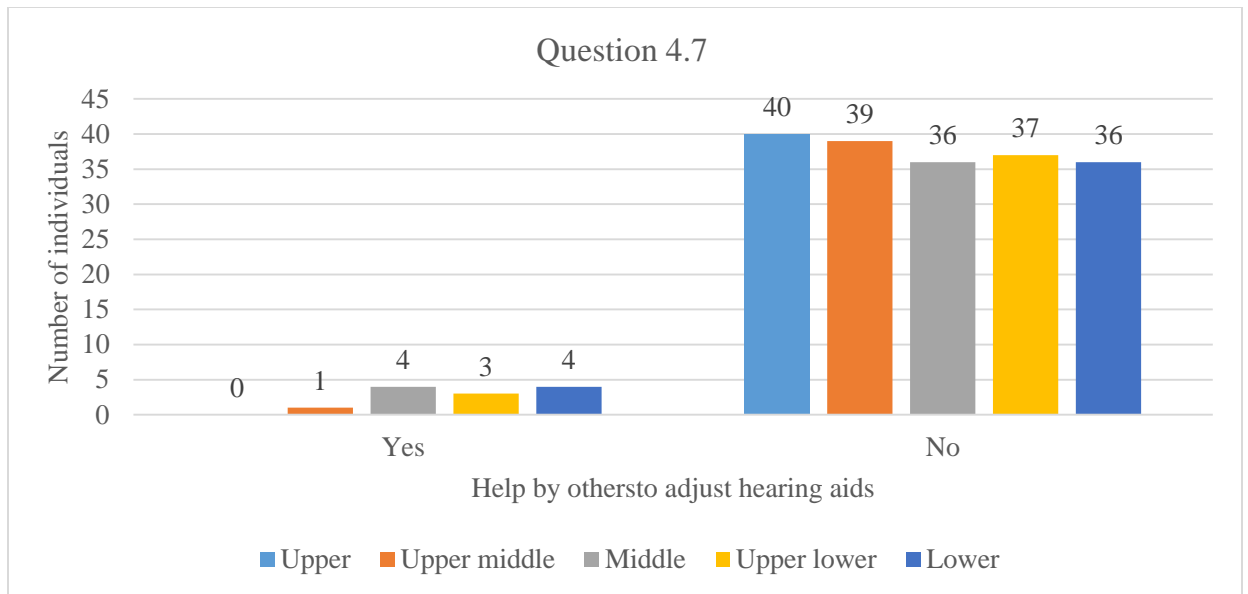


Figure: 4.20g Frequency distribution for Question 4.7 (Help by others to adjust hearing aids) in number of individuals.

None of participants from upper SES have reported to be seeking help from others to adjust their hearing aids. This could be due to higher levels of education and awareness (Yucel et al, 2008), more access sources such as internet (Wangberg, S. C, et al, 2008; Khan, A. S. et al 2016) access to cell phones (Blumenstock, J., & Eagle, N, 2010) and can afford to meet audiologists often. Only 6% of the population said they needed help by others to adjust hearing aids this can be co-related to Question 4.2 where 7% of participants had difficulty in adjusting the controls of hearing aid.

4.21 Question 5

The 5th question describes the satisfaction of the hearing aid user i.e. about how their hearing aid has fulfilled their expectation (4.21). 21% of all participants have reported to be very satisfied. 20% participants of upper and middle SES rated as very satisfied, 42.5% participants of upper middle, 20% of middle SES, 10% of upper lower SES and

12.5% of lower SES reported the same. 60% of participants have reported to be satisfied from their hearing aids. 52.5% of upper SES, 45% of upper middle SES, 62.5% of middle SES, 67.5% of upper lower SES and 72.5% of lower SES rated as satisfied. 19% of participants have rated the dissatisfied. Looking across the strata, results show that 27.5% of upper SES, 12.5% of upper middle SES, 17.5% of middle SES, 22.5% of upper lower SES and 15% of lower SES rated as dissatisfied. 72.5% of lower SES have reported to be satisfied from their hearing aids whereas only 52.5% of upper SES have reported to be satisfied. In rating hearing aid as dissatisfied upper SES has and upper lower SES have major share of 27.5% and 22.5% respectively.

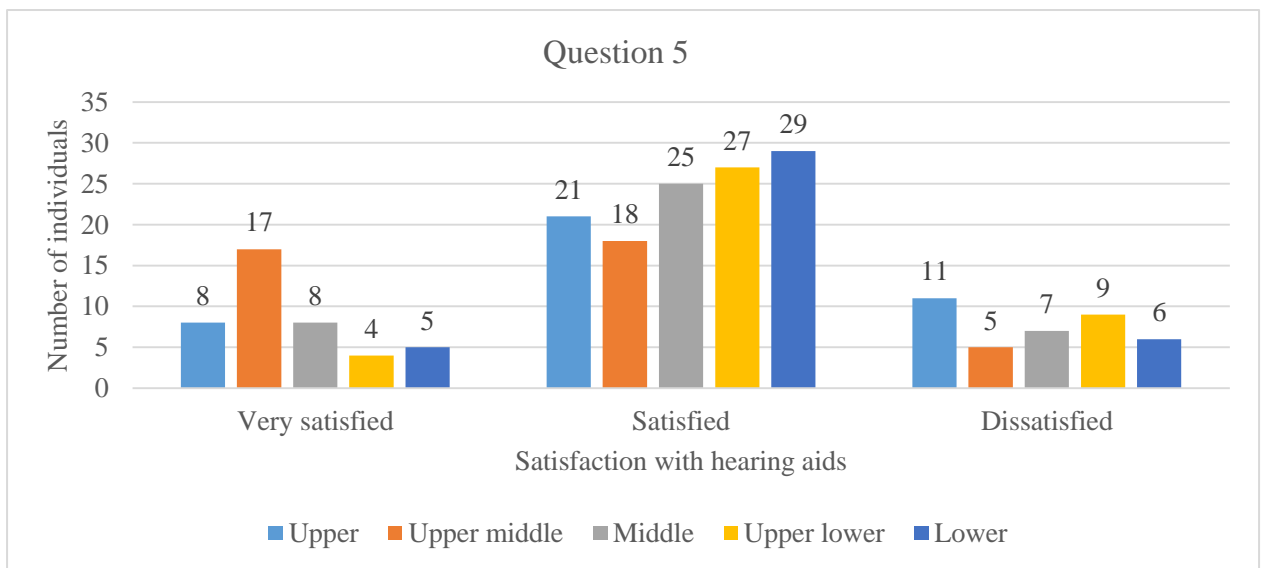


Figure: 4.21 Frequency distribution for Question 5 (Satisfaction with hearing aids) in number of individuals.

Results show that there's significant association between SES and hearing aid satisfaction where lower SES had more satisfied participants than of upper SES ($p < 0.05$). More than 50% of participants reported as satisfied which stands as 2nd on a 4 point rating

scale. Thus it can be stated that majority of hearing aids were delivering expected benefits to users. There was significantly higher proportion of participants from upper lower and lower SES than that of people from higher SES. This could be due to lesser levels of awareness among underprivileged SESs (Yucel et al, 2008) which in turn affects the expectations. Due to lack of awareness people belonging to unprivileged SESs might not develop more or appropriate expectations, they might be happier by mere reinstatement of lost ability to hear the sounds, thereby better satisfaction. In contrast awareness levels are higher among privileged SESs (Yucel et al, 2008) better access to internet (Wangberg, S. C, et al, 2008) and other informative sources makes them to develop greater expectations, which would make it difficult to achieve a higher satisfaction rate. Demanding situations such as speaking over phone, attending meetings, speaking to one or two in silence or speaking to many in a multi talker conditions are more among privileged SESs as seen in first section of the results of the present study. Chances of getting subsidized hearing aids are more for under privileged SESs which reduces the burden on user and making them to be happier and satisfied. Margaret Uriarte (2005) observed that there was a trend of fully subsidized hearing aid recipients having better satisfaction than the partially subsidized and non-subsidized recipients but this was not significant. Among those who ranked as very satisfied majority were from privileged SES. Purchasing power, awareness about technical aspects, features, affordability of consulting multiple audiologists for second opinion, higher educational levels are seen in these SES. These factors primarily with ability to buy higher end hearing aids which comes with better noise reduction, better feedback cancellation algorithms, processing sound with higher fidelity and various connectivity options such as Bluetooth, Wi-Fi or NFC which meets their various demands makes them

to feel more satisfied. Affording these features are of greater difficulty among people of unprivileged SESs due to financial and awareness constraints. Ability to self-adjust and better knowledge about controls are higher among privileged SESs as seen in results of this study. Socio economic status is an important parameter in determining the outcomes of hearing aid and it was observed by the authors that SES had a positive correlation with satisfaction (Knudsen, Oberg, Nielsen, Naylor, & Kramer, 2010). Patient's social and economic status has strong influence on improvement of quality of life by the use of hearing aids (Tsakiropoulou E et al, 2007). Hearing aid fitting is not one-off event it requires regular follow- up and periodic maintenance, this involves cost which have to be met by patient themselves which becomes difficult for people of underprivileged SES for them financial constraints would be important factor though social security policies cover initial cost. This is the stage where difficulty arises for people those who are hailing from lower socio economic status and this difficulty may be the probable reason why these patients usually miss out follow-up and maintenance sessions. These follow-up sessions are critical for fine tuning of the hearing aid and better customization which is required for better satisfaction and outcomes from the hearing aid (Saunders GH, Lewis MS, Forsline A, 2009).Results showed that 19% of the total participants reported dissatisfied. Upper SES rated more dissatisfied with hearing aid use which can be related to high expectations from them.

4.22 Question 6

This question reports the satisfaction in hearing aids repair services in a particular centre i.e. how much is the individual satisfied with the repair services. Participants have to rate the services from one of the following very satisfied, satisfied, dissatisfied, very

dissatisfied (figure 4.22). 97.5% of the participants reported that they did not require any repair services. Among 2.5% of participants who have required repair service 0.5% have reported repair services as satisfied of it all were from upper middle SES, 2% of population have reported repair services as dissatisfied, of them 2.5% were from each upper and upper lower SES, 5% of upper middle have reported as satisfied. Reasons for dissatisfaction could be delay in the repair process which was reported at the time of data collection. There was no significant association between SES and level of repair service satisfaction ($p>0.05$).

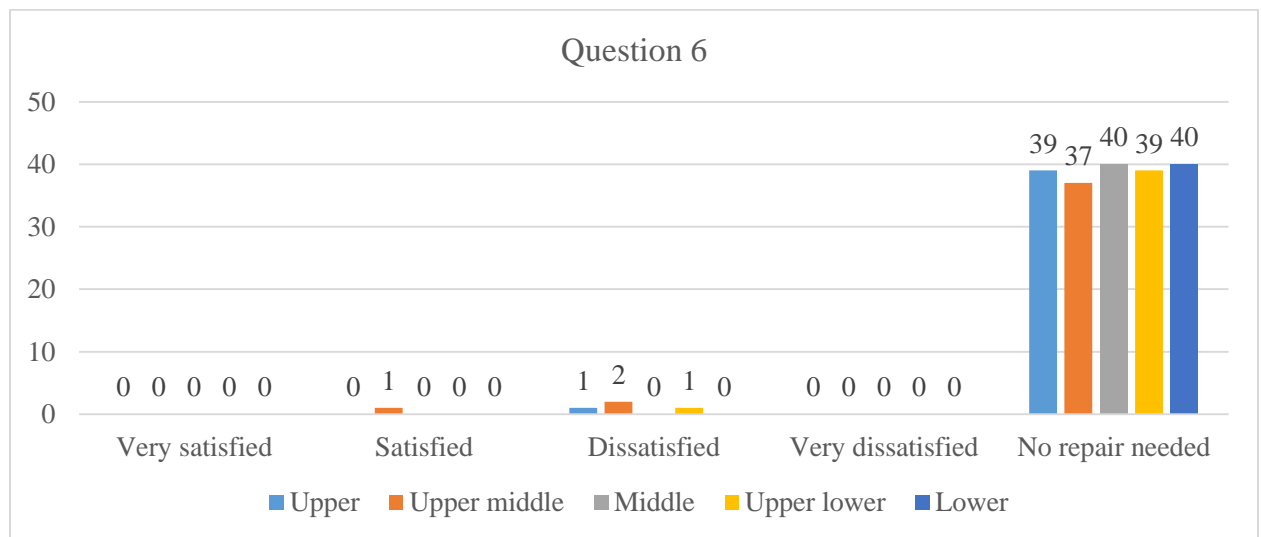


Figure: 4.22 Frequency distribution for Question 6 (Satisfaction with programming and repair service) in number of individuals.

4.23 Question 7

This question describes about the satisfaction of participants about the way they were treated in the clinic (figure 4.23). This is expressed in three levels viz. very satisfied, satisfied, dissatisfied and very dissatisfied. 40% of the participants have rated as very satisfied. 37.5% of upper SES & middle SES, 47.5% of upper middle SES, 22.5% of upper

lower SES and 55% of lower SES have rated treatment as satisfied. 62.5% of upper SES, 52.5% of upper middle SES, 57.5% of middle SES, 77.5% of upper lower SES and 45% of lower SES have reported how participants were treated as satisfied. Overall 59% of study population have rated treatment as satisfied. 5% of middle SES have reported way of treatment to be dissatisfactory which made only 1% of total population to rate treatment as dissatisfied. Association of SES with treatment satisfaction was significant ($p < 0.05$) lower SES and upper lower reported more satisfaction than others.

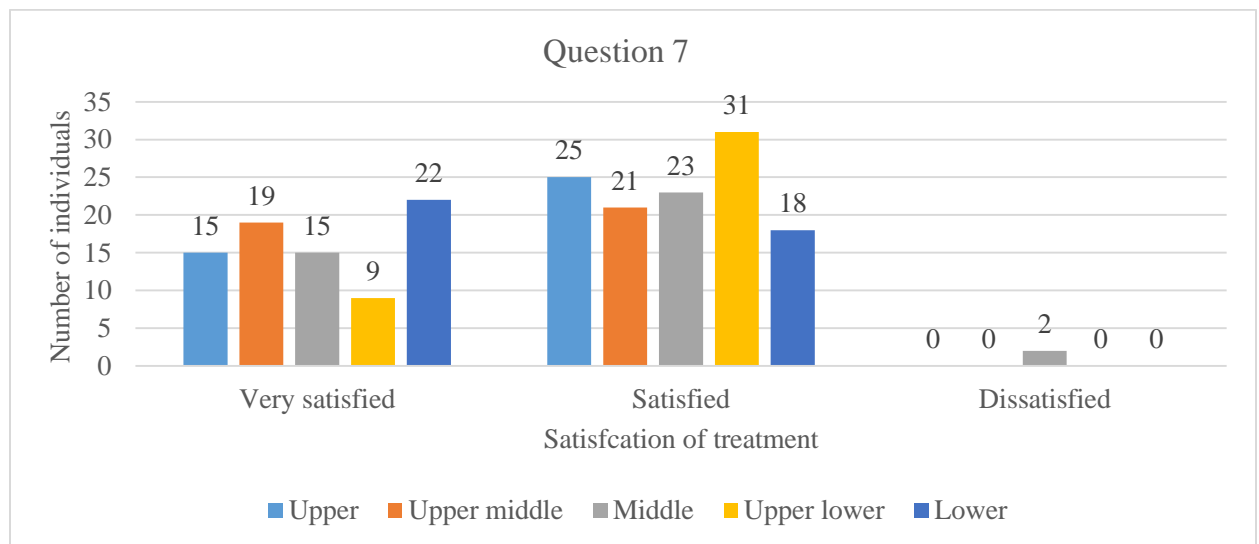


Figure: 4.23 Frequency distribution for Question 7 (Satisfaction of treatment) in number of individuals.

In the current study it's seen that only 5% of the participants were dissatisfied which constituted middle SES. Upper lower and lower SES reported more satisfaction about the way they have been treated by the clinic they went to. More than 90% of participants have reported at least satisfied from the treatment they got from their audiologists. This indicates that audiologists have done fair enough to their patients. Among those who have rated as very satisfied people of lower SES have major share, this could be due to ergonomic

appearance, way how audiologists have responded to their needs, and satisfaction from prescribed hearing aids as seen in above sections.

4.24 Question 8

This question reports if hearing aid users feel it necessary to meet the audiologist soon (figure 4.24). Results reveal that 68.5% of total population did not feel it's necessary for an appointment with their audiologist. 55% of upper SES did not feel need of meeting, 70% of upper middle and lower SES, 80% of middle SES and 67.5% of upper lower SES reported that they did not feel necessary to meet audiologist soon. 31.5% of participants felt that necessary to meet audiologists soon. 45% of upper SES, 30% of upper middle and lower SES, 20% of middle SES and 32.5% of upper lower SES felt the need of meeting audiologists. There was no significant association between SES and necessity of meeting audiologists soon ($p>0.05$).

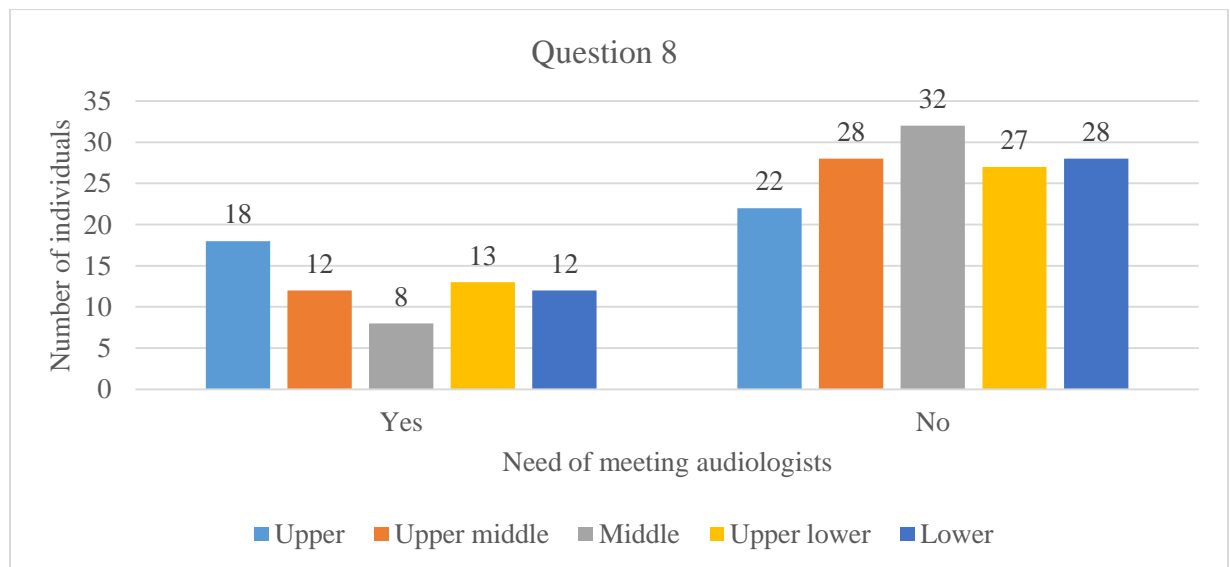


Figure: 4.24 Frequency distribution for Question 8 (Need of meeting audiologists) in number of individuals.

Majority of the participants said they did not feel it necessary to meet audiologist soon. Necessity of meeting their audiologists comes when there are stressing problems in their hearing aids. 1/3rd of participants have reported this need to be present which could be seen more in naïve users as they feel more differences in processed sounds due to lack of acclimatization, this could bring them to their audiologists often. In case of experienced users' reason could be need of fine tunings, appointments for regular programming, changes needed in hearing aids or program due to variation in hearing loss or listening demands and follow up sessions. As these requirements are common among all hearing aid users irrespective of their SES, user's report necessity of meeting their audiologists.

4.25 Question 9

This is an open ended question which describes about the most liked thing in hearing aids or the service from clinic. Many of participants preferred to skip this question by giving reason of not aware of any such things. Among those who answered most commonly repeated things are mentioned here.

1. Multiple program

This was one of most commonly liked feature about hearing aid/s (figure 4.25a). Out of all, 34 people mentioned that multiple program was one of the feature which was most liked about hearing aids. The result shows that multiple program was liked by more number of individuals in privileged SES than those of unprivileged SES. This could be due to ability of the individual to adjust controls, better awareness about hearing aids and educational levels, higher listening demands due to nature of lifestyle and workplace. As seen in the present study more number of people from unprivileged SES have reported

difficulty in adjusting the controls and more number of people from unprivileged SES than privileged SES have reported to seek help from others in adjusting their hearing aids.

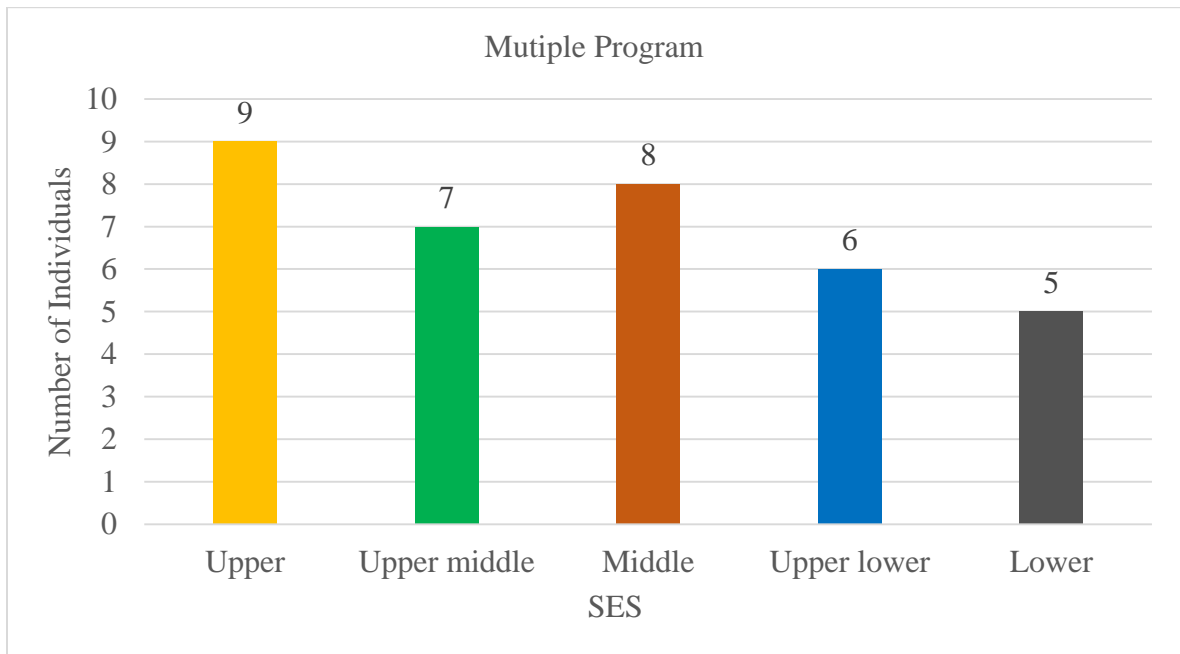


Figure: 4.25a Frequency distribution for Question 9 (Multiple programs) in number of individuals.

2. *Good service by staffs of clinic*

Out of all 30 people had mentioned this making this as third highest among most liked things about service or hearing aids this might have come with quality service by audiologists and clinical in attending to their needs (figure 4.25b).

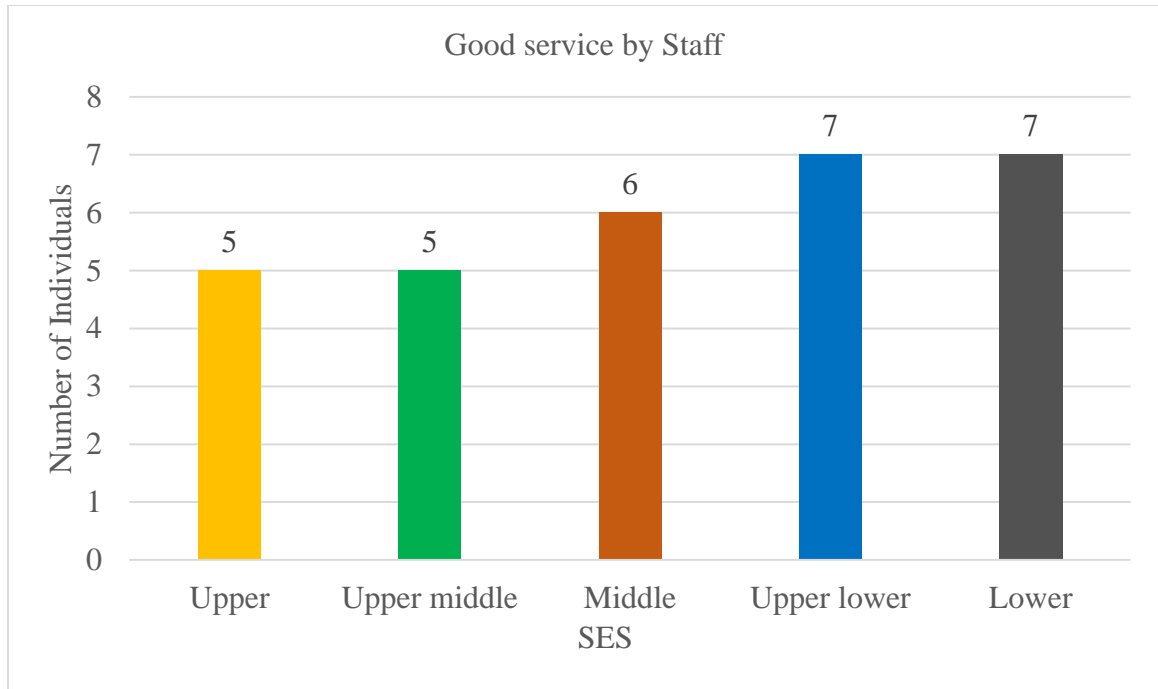


Figure: 4.25b Frequency distribution for Question 9 (Good service by staff) in number of individuals.

3. Infrastructure and facility

Of all 37 participants have reported this factor as they like in service or hearing aids (figure 4.25c). As infrastructure and facilities are key factors in attracting people. Infrastructure can helping in better face validity. There's not much differences among SESs in reporting this. Better infrastructure with skilled clinicians can bring higher satisfaction in patients.

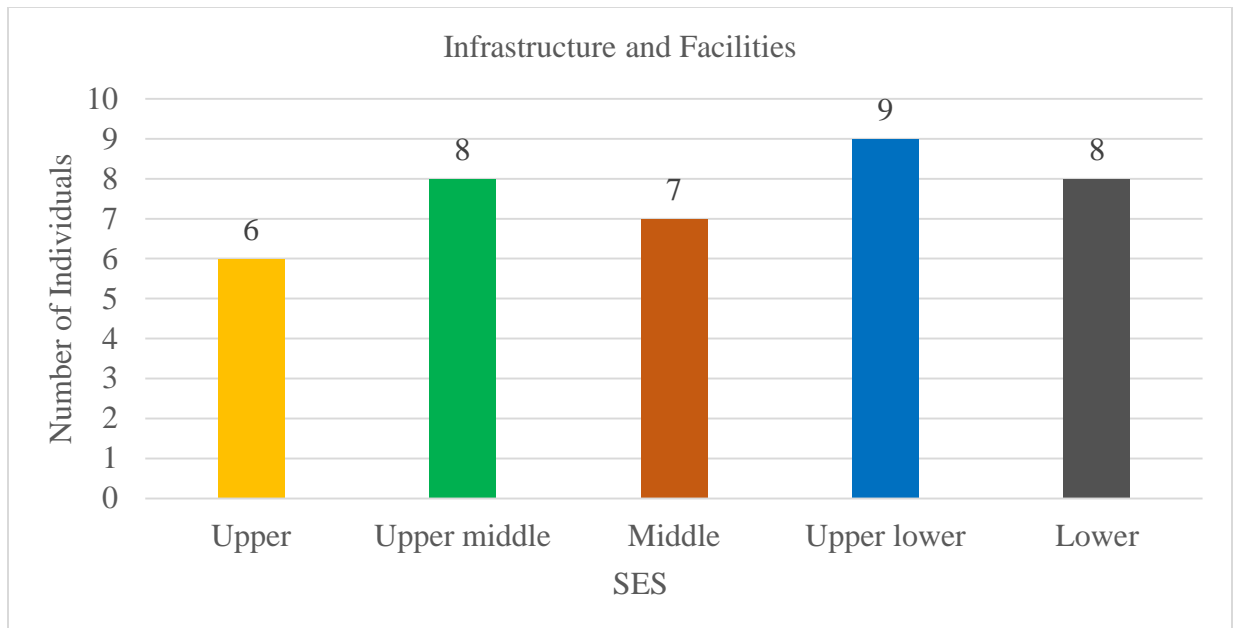


Figure: 4.25c Frequency distribution for Question 9 (Infrastructure and facilities) in number of individuals.

These were the most common liked factors in service or hearing aids provided at their audiological setups. There were other responses such as affordability, accessible working hours, ease of access and better location but these were not repeated much by others.

4.26 Question 10

This question reports about the most disliked aspects about hearing aids or services provided at the center. Majority of the population did not prefer to answer this question. Reason given was there is no such aspects to dislike. Among those who answered 2 aspects were most repeated.

1. *Hearing aid/s are too big in size*

Appearance and cosmetic appeals are preferred by everyone. Anything on them which interferes with their appearance would be bothering them. Hearing aids those are out of the ear such as body level, behind the ear will be disturbing the cosmetic appeal of the users. Totally 58 of all participants have responded for this question. Among these respondent majority were from privileged SES which indicates that cosmetic appearance is important factor. As discussed in previous sections this might be due to increased public appearance, social activities. It's seen from the results that people of unprivileged SES are not much worried or unhappy with size of the hearing aids. Using hearing aids are commonly perceived as indication of ageing and frailty (Stark, P., & Hickson, L. 2004). Lesser expectations and audibility provided hearing aids might have satisfied the underprivileged SES.

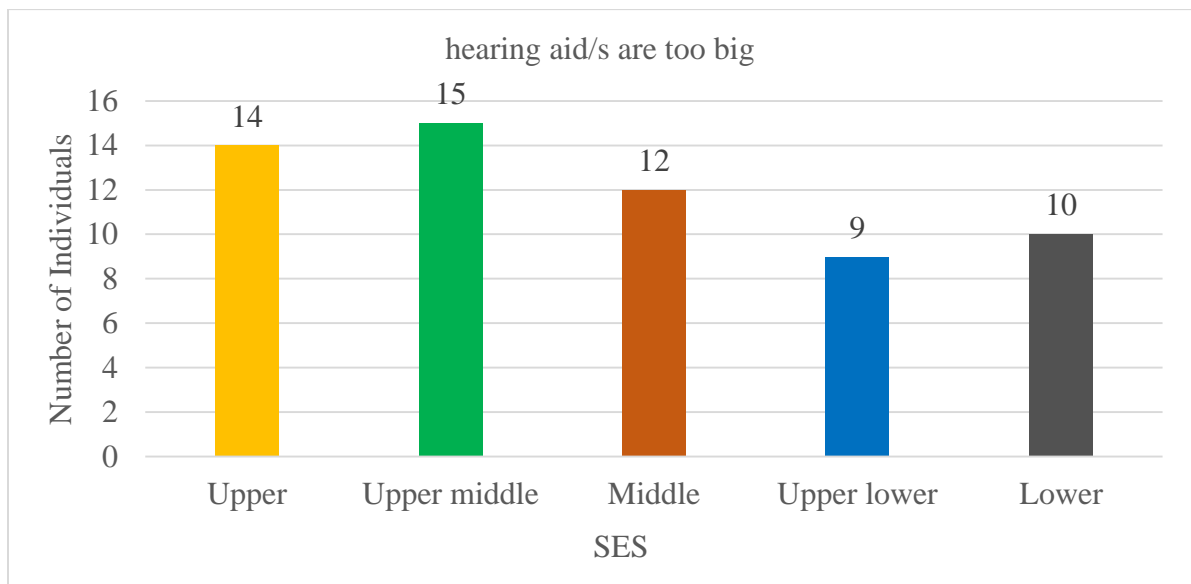


Figure: 4.26a Frequency distribution for Question 10 (size of the hearing aid/s) in number of individuals.

2. Lengthy process of assessment and treatment.

Indeed the assessment and fitting of hearing aids would take longer time unlike getting treated at physicians. The idea about audiological assessment and treatment is less and commonly, they tend to compare with getting treated by general physicians. This could have made them to feel that waiting periods are much longer. Equal proportion of participants from all SES have reported this problem. People have very less awareness about the procedures carried out in audiological assessment. People from privileged SES have rigid working hours which makes them not to afford delays. Whereas lack of awareness could be factor among unprivileged SES.

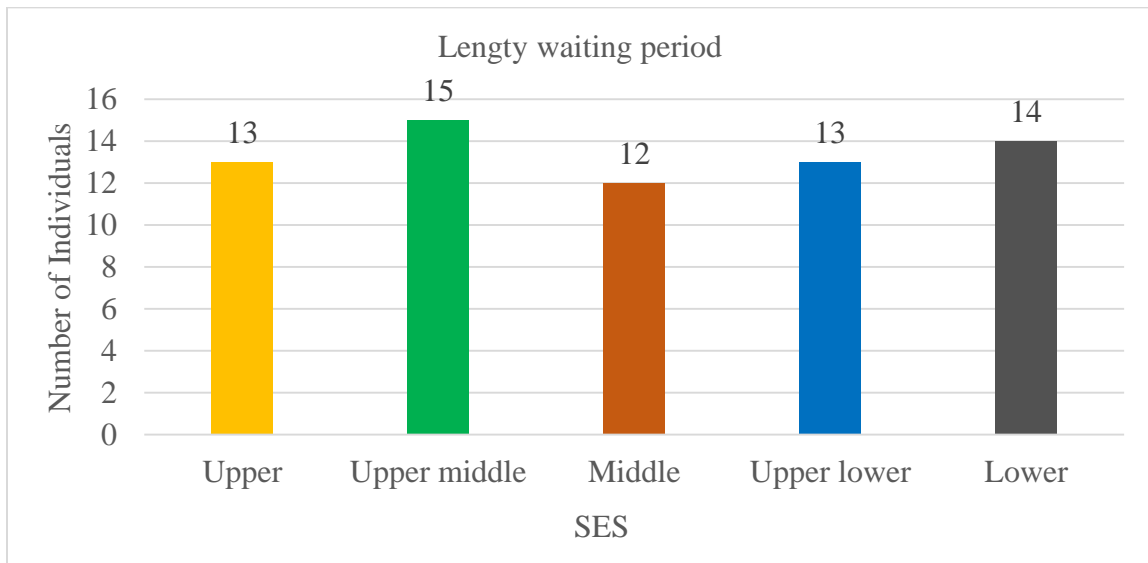


Figure: 4.26b Frequency distribution for Question 10 (Lengthy assessment and treatment) in number of individuals.

CHAPTER 5

SUMMARY AND CONCLUSION

The World Health Organization (2005) estimates indicated that 278 million people are affected by hearing disability, two-thirds of whom live in developing countries like India. In India, 7.6% of the population suffer from significant hearing loss (Garg S et al 2009). The results of National Sample Survey 58th round (2002) showed that hearing impairment was second most common cause of disability and top most cause of sensory deficit. India is diverse country which has population in all slabs of socio economic scale. 12.4% of India's population are in below poverty line (World Bank, 2015). But we have a little literature which says about differential listening needs among diverse population.

Present study was conducted to find out the differences in listening needs and challenging situation across different socio economic strata based on Kuppuswamy's Socio economic scale. The main aim of study was to explore how socio economic strata has effected challenging listening situations and outcomes of hearing aids. Participants of study included 200 subjects, with mild to severe hearing loss in the age range of 18 to 59 years, with experience of using hearing aids for at least three months. They were subdivided into 5 groups Upper SES, Upper middle SES, Middle SES, Upper lower SES and Lower SES, each group consisting 40 individuals. Client Oriented Scale of Improvement (COSI) there are 16 different categories in COSI and subjects were asked to rank top five preferred situations, Hearing Aid Users Questionnaire (HAUQ) were administered and participants were expected to choose appropriate option. Responses were analyzed using IBM's Statistical Package for Social Studies (version 23). Chi-square test was administered to find out association of SES and items in HAUQ questionnaire. Cross tabulation was used to

obtain statistics about preferred listening situation across SES. The results obtained through analysis are summarized as below.

Conversation with 1 or 2 in quiet was ranked as first by participants of upper SES, as second by lower SES and middle SES and as third by lower SES. This was in highly preferred situations by the participants. Conversation with 1 or 2 in noise was ranked as first majorly by unprivileged SES (upper lower SES and lower SES). For privileged SES this was of second choice. This situation was one among highly preferred listening situations. Majority of participants have ranked Conversation with group in quiet as second, people of unprivileged SES have upper hand in ranking as two. This situation was there among highly preferred listening need. Conversation with group in noise was majorly ranked as third by unprivileged SES and first by privileged SES. This was one among highly preferred communication need. Majority of participants have ranked listening to TV or radio at normal volume as third by majority of upper SES, upper middle SES or fourth choices by middle SES, upper lower SES and lower SES. This was choice of many participants hence this is among more preferred listening situations. Familiar speaker on phone was mainly ranked as 4th by privileged SES and as 5th by unprivileged SES. This was one among top five listening situation in majority of participants. Unfamiliar speaker on phone was not among top preferred situations as only less than 25% of participants have ranked for this. This was ranked as 3rd and 4th in small number of participants all the SES have almost equal hand in ranking as 3rd and 4th. Hearing phone call from other room was not preferred by much of participants and ranked as 5th unprivileged SES have upper hand in this ranking. Hearing front door bell or knock was preferred by a little people and majority of them were from unprivileged SES this isn't in most preferred listening

situation. Hear traffic was preferred as 4th equally by all SES and as 5th mainly by upper SES and upper middle SES this was preferred as one of top five priorities by small group. Increased social contact is ranked mainly as 4th by all SES with equal shares and in ranking as 5th upper SES and upper middle SES has major shares, only a little participants have ranked this in top five listening situations. Feeling embarrassed or stupid was ranked only by small group of people it's mainly given a rank of 5th. Upper SES and upper middle SES have major share. A few participants have given rank to feeling left out as 5th all were from lower SES. Feeling upset or angry was choice of only a few lower SES has major contribution in ranking as 5th. Very small group of population have given ranks to this. This was ranked as 5th by majority and mainly from underprivileged SES. None of the participants have chosen other situation. COSI has helped to explore profiles of listening demands. For all major listening situations were first six situations.

In general conversation with one two in silence and conversation with group in silence were preferred with top priorities among upper and upper middle SES participants and conversation with one or two and with group in noise were preferred with top priorities by people of unprivileged SES. People of privileged SES had higher needs of listening over telephone than people of unprivileged SES. Increased social contacts was more preferred among privileged SES. Listening to TV or radio was required with more or less priority by people of all SES.

HAUQ gives the outcomes of hearing aids across different socio economic strata.

1. Majority of binaural hearing aids users were from upper SES, upper middle SES and some from middle SES, majority of monaural hearing aid users were of upper lower SES and lower SES.
2. More than 75% OF participants are using hearing aids more than 8 hours in a day irrespective of SES. Some group of participants irrespective SES used for 4 to 8 hours in a day. SES did not have any effect on duration of hearing aid/s usage.
3. Majority of participants have reported that their hearing aid/s were benefitting at least a little times in family situations. There was no significant association of SES with help from hearing aid/s in family situation.
4. Upper SES, upper middle SES and middle SES were significantly helped from their hearing aids than unprivileged SES in small conversations.
5. Hearing aids to be found helping a little times in meetings, temples or social gatherings. There was no significant association of SES with help from hearing aid/s in this situation.
6. Hearing aids were found to be helping users in social activities a little of times. A smaller group of participants have also reported not at all helpful indicating lesser benefits from hearing aids. SES had no significant association.
7. Hearing aid/s were helping a little times in watching television or listening to radio. People of upper SES and upper middle SES obtained significantly higher help from their hearing aids than others.
8. Majority of participants have reported a little help from their hearing aids in speaking on cell phones or telephones. There is a significant association of SES where more number of people from unprivileged SES had reported a little help and

also there are more number of people from privileged SES among those who have reported helpful a lot times.

9. There was no significant difficulties in placing and removing hearing aids in any of SES.
10. Squealing was present in some of participants but had no significant association with SES.
11. Only a small number of participants had discomfort which were due to improper mold fittings. The association of SES was insignificant.
12. Very little number of hearing aid/s users have reported positive to sudden unbearably loud noises problems. There's no significant association with SES. Most of all hearing aids were able to limit very loud noises reaching ears.
13. Problem of hollow or echoing quality of users own voice from hearing aids was problem of a few. There was no significant association of SES with this.
14. Very few participants required help from others in adjusting hearing aids. Nonetheless insignificance it was seen mainly in people of unprivileged SES. None from upper SES have reported go be getting help from others in adjusting their hearing aid/s.
15. About 60% of participants have reported their hearing aids to be satisfied and about 1/4th of participants reported to be very satisfied. People of unprivileged SES had significantly higher levels of satisfaction than privileged SES.
16. More than 90% of participants did not require any repairs in their hearing aids. Delays in hearing aid repairs reported as major cause of dissatisfaction among those who required repair. There was no significant association with SES.

17. More than 90% of participants reported as they were satisfied or very satisfied with way of treatment given at audiological setups where they visited. Satisfaction levels are significantly higher among people of unprivileged SES.

18. Majority of participants had not felt need of immediate appointment with their audiologists. There was no significant association of SES with feel of need to meet audiologists.

Hearing aids were able to satisfy more than 50% of participants, of whom higher satisfaction was found among participants from unprivileged SES. Participants of privileged SES required more help from their hearing aids but were unable to get. Participants of higher SES obtained more help from their hearing aid/s in situation such as meetings, social gatherings, offices etc. participants of unprivileged SES had difficulties in placing or removing hearing aids and adjusting controls of hearing aid/s. satisfaction was found to be more among participants of unprivileged SES.

Multiple programs option were majorly liked by participants from upper SES, upper middle SES and middle SES. Most of participants in unprivileged SES liked services provided by audiological clinics. Infrastructure and facilities were one among most commonly liked things. Larger sizes of hearing aids were majorly disliked by participants of privileged SESs. Lengthier time for audiological treatment and waiting duration was among most commonly disliked things.

Implications of study

1. The study will be helpful in supporting need of customized hearing aid fitting procedures.
2. The results obtained can be used in counselling the hearing aid users effectively in dealing with real life listening challenges.
3. Helps clinicians/audiological practitioners to understand differential needs of hearing impaired and to modify current fitting approaches which are mainly based on simple speech score testing approach.
4. Guides audiologists to fine tune the different programs with need based approach depending on SES of an individual.
5. The study will also give some insight about relationship between hearing aid use, listening situations and socio economic strata which can assist the professional to plan more efficient aural rehabilitation plans.

Limitations of the study;

Sample size was very small for statistical procedures to be more efficient.

Literature support for the study is very less only a little studies were found.

Future research:

Differences in perceived handicapness can be assessed across SESs. Effect of SES on process of aural rehabilitation in congenitally deaf children can be assessed.

Standardizing and developing norms for translated Kannada questionnaires.

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APPENDICIES

Appendix I Translated Kannada Client Oriented Scale of Improvement

ವ್ಯಕ್ತಿಗೆ ಸಂಬಂಧಿಸಿದ ಸುಧಾರಣ ಮಾಪಕ

ಹೆಸರು:

ವರ್ಗ :ಹೊಸ

ದಿನಾಂಕ:

ಶ್ರವಣ ತಜ್ಞ:

ಹಿಂದಿರುಗಿಸಿದ

೧ ಸ್ಥಾಪಿತ ಅಗತ್ಯಗಳು ೨ ಮೌಲ್ಯ ಮಾಪಿತ ಫಲಿತಾಂಶ

ನಿರ್ದಿಷ್ಟ ಅಗತ್ಯಗಳು

ಮಹತ್ವದ ಅನುಸಾರ ಸೂಚಿಸಿ

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

ಬದಲಾವಣೆಯ ಮಟ್ಟ

ಕಳಪೆ	ಏನು ಬದಲಾವಣೆ ಇಲ್ಲ	ಸಾಧಾರಣ	ಉತ್ತಮ	ಅತ್ಯುತ್ತಮ

ಅಂತಿಮವಾಗಿ ಕೇಳುವ ಸಾಮರ್ಥ್ಯ (ಶ್ರವಣಯಂತ್ರದೊಂದಿಗೆ)

ವಿರಳವಾಗಿ 10%	ಕೆಲವೊಮ್ಮೆ 25%	ಸಾಮಾನ್ಯವಾಗಿ 50%	ಹೆಚ್ಚಾಗಿ 75%	ಯಾವಾಗಲೂ 95%

೧. ನಿಶ್ಚಿತವಾಗಿದ್ದಾಗ ಒಬ್ಬರೊಂದಿಗೆ ಮಾತನಾಡುವಾಗ
೨. ಗದ್ದಲದಲ್ಲಿದ್ದಾಗ ಒಬ್ಬರೊಂದಿಗೆ ಮಾತನಾಡುವಾಗ
೩. ನಿಶ್ಚಿತವಾಗಿದ್ದಾಗ ಗುಂಪಿನಲ್ಲಿ ಮಾತನಾಡುವಾಗ
೪. ಗದ್ದಲದಲ್ಲಿದ್ದಾಗ ಗುಂಪಿನಲ್ಲಿ ಮಾತನಾಡುವಾಗ
೫. ಸಾಮಾನ್ಯವಾಗಿ ಮಟ್ಟದ ಧ್ವನಿಯಲ್ಲಿ ಟಿ.ವಿ ನೋಡುವುದು/ರೇಡಿಯೋ ಕೇಳುವುದು

೬. ಕರೆಫಂಟ್ ಶಬ್ದ ಅಥವಾ ಬಾಗಿಲು ಬಡಿದ ಶಬ್ದ ಕೇಳಿಸಿಕೊಳ್ಳುವುದು
೭. ಪರಿಚಿತರೊಂದಿಗೆ ದೂರವಾಣಿಯಲ್ಲಿ ಮಾತನಾಡುವಾಗ
೮. ಅಪರಿಚಿತರೊಂದಿಗೆ ದೂರವಾಣಿಯಲ್ಲಿ ಮಾತನಾಡುವಾಗ
೯. ಬೇರೆ ಕೋಣೆಯಿಂದ ದೂರವಾಣಿ ಕರೆ ಕೇಳಿಸಿಕೊಳ್ಳುವುದು
೧೦. ಮುಜುಗರ ಅಥವಾ ಮೂರ್ಛಿತನದ ಭಾವನೆ

೧೦. ಸಂಚಾರಿ ಗದ್ದಲ (ವಾಹನಗಳ ಶಬ್ದ)
೧೧. ಸಮಾಜದೊಂದಿಗೆ ಹೆಚ್ಚಿನ ಸಂಪರ್ಕ
೧೨. ಬೇಜಾರು ಅಥವಾ ಕೋಪ
೧೩. ಮಂದಿರ/ಚರ್ಚ್ ಅಥವಾ ಸಭೆ
೧೪. ಇನ್ನಿತರೆ

Appendix II Translated Kannada Hearing Aid User's Questionnaire

ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೂ ಉತ್ತರವಾದ ಉತ್ತರವನ್ನು ಗುರುತು ಮಾಡಿ

ಪ್ರಶ್ನೆ.1 ನೀವು ಸಾಮಾನ್ಯವಾಗಿ ಎಷ್ಟು ಶ್ರವಣೋಪಕರಣಗಳನ್ನು ಧರಿಸುವಿರಿ?

1.ಒಂದು

2.ಎರಡು

ಪ್ರಶ್ನೆ.2 ಶ್ರವಣೋಪಕರಣಗಳನ್ನು ಸಾಧಾರಣವಾಗಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ಧರಿಸುವಿರಿ?

1.ದಿನಕ್ಕೆ ೮ ಅಥವಾ ೮ ಗಂಟೆಗಳಿಗಿಂತ ಹೆಚ್ಚು ಸಮಯ?

2.ದಿನಕ್ಕೆ ೪ ರಿಂದ ೮ ಗಂಟೆಯ ಸಮಯ?

3.ದಿನಕ್ಕೆ ೧ ರಿಂದ ೪ ಗಂಟೆಯ ಸಮಯ?

4.ದಿನಕ್ಕೆ ೧ ಗಂಟೆಗಿಂತ ಕಡಿಮೆ, ಆದರೆ ವಾರದಲ್ಲಿ ೧ ಗಂಟೆಗಿಂತ ಹೆಚ್ಚಿನ ಸಮಯ?

5.ವಾರದಲ್ಲಿ ೧ ಗಂಟೆಗಿಂತ ಕಡಿಮೆ ಸಮಯ?

6.ಧರಿಸುವುದೇ ಇಲ್ಲ ?

ಶ್ರವಣೋಪಕರಣವನ್ನು ಧರಿಸದೇ ಇದ್ದಲ್ಲಿ , ದಯವಿಟ್ಟು ಕಾರಣ

ತಿಳಿಸಿ.....

ಪ್ರಶ್ನೆ.3 ಕೆಳಗೆ ಪಟ್ಟಿ ಮಾಡಿರುವ ಸನ್ನಿವೇಶಗಳಲ್ಲಿ ನಿಮ್ಮ ಶ್ರವಣೋಪಕರಣ ಎಷ್ಟು ಸಹಾಯಕವಾಗಿದೆ?

ಸನ್ನಿವೇಶ	ತುಂಬಾ	ಸ್ವಲ್ಪ	ಇಲ್ಲವೇ ಇಲ್ಲ	ಸಹಾಯ ಅವಶ್ಯಕವಿಲ್ಲ
ಕುಟುಂಬದಲ್ಲಿ				
ಸಣ್ಣ ಗುಂಪುಗಳಲ್ಲಿಸಂಭಾಷಿಸುವಾಗ				
ಸಭೆಗಳಲ್ಲಿ (ಭಾಷಣ, ವೃತ್ತಿ ಸಂಬಂಧಿತ ಚರ್ಚೆಗಳು)				

ಸಾಮಾಜಿಕ ಚಟುವಟಿಕೆಗಳಲ್ಲಿ (ಮನೋರಂಜನೆ, ಸಂಗೀತ, ಮದುವೆ, ಕೌಟುಂಬಿಕ ಕಾರ್ಯಕ್ರಮಗಳು)				
ಟಿ.ವಿ ಮತ್ತು/ಅಥವಾ ರೇಡಿಯೋ ಕಾರ್ಯಕ್ರಮ ಕೇಳಿಸಿಕೊಳ್ಳುವಾಗ				
ದೂರವಾಣಿಯಲ್ಲಿ ಸಂಭಾಷಿಸುವಾಗ				

ಪ್ರಶ್ನೆ 4 ಶ್ರವಣೋಪಕರಣದಲ್ಲಿನ ಈಗಿರುವ ತೊಂದರೆಗಳು...

	ಹೌದು	ಇಲ್ಲ
ಅ) ಶ್ರವಣೋಪಕರಣ ಧರಿಸುವಾಗ ಅಥವಾ ತೆಗೆಯುವಾಗ ತೊಂದರೆಯಾಗುವುದೇ?		
ಆ) ಶ್ರವಣೋಪಕರಣದಲ್ಲಿರುವ ನಿಯಂತ್ರಣಗಳನ್ನು ಬಳಸುವುದರಲ್ಲಿ ತೊಂದರೆಯಿದೆಯೇ?		
ಇ) ಶ್ರವಣೋಪಕರಣವನ್ನು ಚೆನ್ನಾಗಿ ಕೇಳಿಸುವ ಮಟ್ಟದಲ್ಲಿ ಇಟ್ಟಿರುವಾಗ ಶಿಳ್ಯೆಯ ಶಬ್ದ ಹೊರಬರುವುದೇ?		
ಈ) ಶ್ರವಣೋಪಕರಣ ಅಥವಾ ಕಿವಿಯಿಚ್ಚುಗಳನ್ನು ಇಟ್ಟಿರುವ ಬಗ್ಗೆ ನಿಮಗೆ ಅಸಮಾಧಾನಕರ ಭಾವನೆ ಇದೆಯೇ?		
ಉ) ಶ್ರವಣೋಪಕರಣವು ಇದ್ದಕ್ಕಿದ್ದಂತೆ ಗಟ್ಟಿಯಾದ ಶಬ್ದಗಳನ್ನು ಹೆಚ್ಚಿಸಿ, ಶಬ್ದ ತಡೆಯಲಾಗದ ಭಾವನೆಯುಂಟು ಮಾಡುವುದೇ?		
ಊ) ನಿಮ್ಮದೇ ಧ್ವನಿಯು ಪ್ರತಿಧ್ವನಿಯಾಗುವುದೇ ಅಥವಾ ಟೊಳ್ಳಾಗಿ ಕೇಳಿಸುವುದೇ?		
ಋ) ಇತರ ವ್ಯಕ್ತಿಗಳು ನೀವು ಶ್ರವಣೋಪಕರಣಕ್ಕೆ ಹೊಂದಿಕೊಳ್ಳಲು ನಿಮಗೆ ಸಹಾಯ ಮಾಡುತ್ತಿರುವರೇ?		

ಪ್ರಶ್ನೆ.5 ಶ್ರವಣೋಪಕರಣದ ಉಪಯುಕ್ತತೆ ಬಗ್ಗೆ ನಿಮ್ಮ ತೃಪ್ತಿಯನ್ನು ಹೇಗೆ ಸೂಚಿಸುವಿರಿ?

- 1.ತುಂಬಾ ತೃಪ್ತಿಯಿದೆ,
- 2.ತೃಪ್ತಿಯಿದೆ,
- 3.ಅತೃಪ್ತಿಯಿದೆ,
- 4.ತುಂಬಾ ಅತೃಪ್ತಿಯಿದೆ

ಪ್ರಶ್ನೆ.6 ಸಂಸ್ಥೆಯಲ್ಲಿ ನಿಮ್ಮ ಶ್ರವಣೋಪಕರಣದ ರಿಪೇರಿ ಅಥವಾ ಸರ್ವೀಸ್ ಬಗ್ಗೆ ಹೇಗೆ ವಿವರಿಸುವಿರಿ?

- 1.ತುಂಬಾ ತೃಪ್ತಿಯಿದೆ,
- 2.ತೃಪ್ತಿಯಿದೆ,
- 3.ಅತೃಪ್ತಿಯಿದೆ,
- 4.ತುಂಬಾ ಅತೃಪ್ತಿಯಿದೆ,
- 5.ಯಾವುದೇ ರಿಪೇರಿ ಬೇಕಿಲ್ಲ

ಪ್ರಶ್ನೆ.7 ಸಂಸ್ಥೆ/ಕೇಂದ್ರದಲ್ಲಿ ನಿಮ್ಮ ಅವಶ್ಯಕತೆಗಳನ್ನು ನೋಡಿಕೊಳ್ಳುವುದರ ಬಗ್ಗೆ ನಿಮ್ಮ ಅಭಿಪ್ರಾಯ ತಿಳಿಸಿ.

- 1.ತುಂಬಾ ತೃಪ್ತಿಯಿದೆ,
- 2.ತೃಪ್ತಿಯಿದೆ,
- 3.ಅತೃಪ್ತಿಯಿದೆ,
- 4.ತುಂಬಾ ಅತೃಪ್ತಿಯಿದೆ.

ಪ್ರಶ್ನೆ.8 ನಿಮ್ಮ ಶ್ರವಣತಜ್ಞರನ್ನು ಶೀಘ್ರದಲ್ಲಿಯೇ ಭೇಟಿ ಮಾಡಬೇಕಾದ ಅವಶ್ಯಕತೆಯಿದೆಯೇ?

- 1.ಹೌದು
- 2.ಇಲ್ಲ

ಪ್ರಶ್ನೆ.9 ಶ್ರವಣೋಪಕರಣ ಅಥವಾ ಸರ್ವೀಸ್ ಬಗ್ಗೆ ನಿಮಗೆ ತುಂಬಾ ಇಷ್ಟವಾದ

ವಿಷಯ?.....

ಪ್ರಶ್ನೆ.10 ಶ್ರವಣೋಪಕರಣ ಅಥವಾ ಸರ್ವೀಸ್ ಬಗ್ಗೆ ನಿಮಗೆ ಇಷ್ಟವಲ್ಲದ

ವಿಷಯ?.....

ಪ್ರಶ್ನೆ.11 ನಿಮ್ಮ ಶ್ರವಣೋಪಕರಣ ಅಥವಾ ಸರ್ವೀಸ್ ಬಗ್ಗೆ ನೀವು ಬದಲಾವಣೆ ಮಾಡಬೇಕಿದ್ದಲ್ಲಿ,

ಅದು.....

ನಿಮ್ಮ ಅಭಿಪ್ರಾಯಕ್ಕಾಗಿ ವಂದನೆಗಳು..

Appendix III Modified Kuppuswamy's Socio Economic Scale

(B) Occupation Score		
1	Profession	10
2	Semi-Profession	6
3	Clerical, Shop-owner, Farmer	5
4	Skilled worker	4
5	Semi-skilled worker	3
6	Unskilled worker	2
7	Unemployed	1

(B) Occupation Score		
1	Profession	10
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<i>INCOME (Modified for 2012 in Rs)</i>	<i>Score</i>		Modified for 2012 in Rs	Total Score
≥32050	12		Upper (I)	26-29
16020 – 32049	10		Upper Middle (II)	16-25
12020 – 16019	6		Middle/Lower middle (III)	11-15
8010 – 12019	4		Lower/Upper lower (IV)	5-10
4810 – 8009	3		Lower (V)	<5
1601 – 4809	2			
≤ 1600	1			