

**OUTCOMES OF HEARING AID AND CHALLENGING
SITUATIONS IN LISTENING: A CROSS SECTIONAL STUDY
ACROSS RURAL AND URBAN UNITS**

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**This Dissertation is submitted as part fulfillment for the Degree of Master of
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Mysuru

May 2017

CERTIFICATE

This is to certify that the dissertation entitled “**OUTCOMES OF HEARING AID AND CHALLENGING SITUATIONS IN LISTENING: A CROSS SECTIONAL STUDY ACROSS RURAL AND URBAN UNITS**” is the bonafide work submitted in part fulfillment for the degree of Master of Science (Audiology) of the student (Registration No. 15AUD029). 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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DECLARATION

This is to certify that this dissertation entitled “**OUTCOMES OF HEARING AID AND CHALLENGING SITUATIONS IN LISTENING: A CROSS SECTIONAL STUDY ACROSS RURAL AND URBAN UNITS**” 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 objective of the study was to find out the differences in outcomes of hearing aids and challenges in listening situations across rural and urban population. In addition, to find the relationship between hearing aid uses, listening situations and strata of society will be examined.

Introduction: The nature and life styles of people living in these two societies are also different. Life in the rural society is very simple and reflects in the way of living, dressing, food habits, shelter and manners etc., whereas life in the city is not simple but very complex and complicated. Hearing aids outcome vary across different listening situations and these listening situations vary in rural and urban population. Listening situation mainly depends the lifestyle, place they dwell in and socioeconomic activities.

Study sample: Total of 200 Kannada speaking subjects in the age range of 18 to 59 years with the hearing loss ranging from moderate to profound hearing loss and using hearing aids at least since three months was chosen for the study. Two units will be made based on their place of residence, units consisting of hearing aid users henceforth called as urban units and rural areas units. Kannada version of HHQ4, IOI-HA5, and SAC6 were administered using personal and telephone interview.

Results: 25.5% reported as often aware of hearing impairment in which 54.9% were urban and 45.1% were rural population. The problem of feeling nervous or being uncomfortable due to hearing impairment was significantly ($p < 0.05$) less among rural dwellers. The confidence level was significantly affected majority of times in urban participants than the rural participants ($p < 0.05$). Irrespective of the population majority of the participants used hearing aids for more than 8 hours a day ($p > 0.05$). Rural population was benefited much from hearing aid/s than urban population ($p < 0.05$) in different listening situations.

Conclusion: Urban population had more difficulty in challenging listening situations than rural population. It's seen that challenges in listening situations vary across type of areas where the subjects are hailing from. Majority of the participants had moderate level of satisfaction with hearing aid and rural participants had higher rates of satisfaction. Urban population were satisfied more than rural with hearing aid use.

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Chapter 1

INTRODUCTION

A society is a group of people involved in persistent social interaction, or a large social grouping sharing the same geographical or social territory, typically subject to the dominant cultural expectations. Societies are characterized by patterns of relationships (social relations) between individuals who share a distinctive culture and institutions; a given society may be described as the sum total of such relationships among its constituent members. In the social sciences, a larger society often evinces stratification or dominance patterns in subgroups.

The main such stratification is rural society and urban society. These two differs in various ways with respect to each other such as day-to-day lifestyle, economic, religious, work etc. As the makeup of society changes the nature of people living in it also changes accordingly. The nature and life styles of people living in these two societies are also different. Life in the rural society was very simple and reflected in the way of living, dressing, food habits, shelter and manners etc., whereas life in the city is not simple but very complex and complicated.

Rural societies: The people in the society have homogeneity, similar social status, and very little scope for occupational mobility. In villages there is no fast change and as such no necessity for social adaptability. Work places are quite similar and do not vary much from each other. The influence of technology and appliances are quite less in these areas although now-a-days cellphone and televisions have reached some parts of population. The cultural and religious beliefs vary largely, people in rural areas are more religious and prevalence of superstitions can be seen quite more. The myths and misconceptions regarding hearing loss are more prevalent in rural areas (Manjunath Y N, 2014).

Urban living offers a great deal of opportunities to the people including high level of education, a wide range of employment options. Those people who live in urban areas have a chance to take an active part in political, social and cultural events. Urban living also provides the best opportunities for pleasure which include visiting theater, movies, museums, art galleries, and circus and so on. These people are more exposed to noises such as traffic noise, construction noise, manufacturing and household noises where they have challenging situations to hear.

The notion of aural rehabilitation 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, making a better lifestyle out of his disability, providing rehabilitation such that patient appreciates the outcomes.

The outcomes from the hearing aid can be assessed by different methods. Most commonly used are i) Subjective tests, such as aided pure tone audiometry, speech detection or recognition scores, ii) Objective tests, which involves use of auditory evoked potentials such as Aided Slow cortical potentials, the drawbacks of these tests are their inability to generalize the results and limitation of reflecting the real life situations which are completely different from these laboratory conducted tests. iii) Self-reported questionnaires such as COSI, HHQ4, IOI-HA5, SAC6, PS (participation scale), APHAB, SADL etc. These questionnaires have advantage over lab based tests by the nature of their administration. Patient reports his/her observations from real life situations unlike other two methods which are lab based. Among these HHQ4, IOI-HA5, SAC6, PS (participation scale) are translated to Kannada language (Spoorthi et

al 2016) which will enable us to find out how different are the outcomes of hearing aid among rural and urban population.

HHQ4 hearing handicap questionnaire is an instrument to measure hearing disability as defined by WHO's international classification of functioning, disability and health (ICF). This questionnaire has 12 questions and uses a 5-point scale from *never to almost always* as a response option. Emotional distress and uneasiness, social withdrawal and participation restrictions are the domains measured by this instrument. HHQ is reported to be having good Cronbach's alpha (internal consistency) for both the emotional (0.95) and social scale (0.93).

IOI-HA5 the International Outcome Inventory for Hearing Aid aims to assess the effectiveness of hearing aid rehabilitation. It is a seven-item self-report questionnaire evaluating seven different hearing aid outcome domains, including: i) hearing aid use; ii) benefit; iii) activity limitations (residual); iv) satisfaction; v) residual participation restriction; vi) impact on others and vii) quality of life. The original version of IOI-HA is in English and was developed by Cox and colleagues. This questionnaire has now been translated into thirty different languages and is used worldwide. The psychometric properties of the English version on veteran hearing aid users indicate good internal consistency 0.83 (Cronbach's alpha) and high test-retest reliability (0.94).

SAC6 self-assessment of communication is also one of the hearing aid outcome questionnaires developed based on WHO-ICF. In this questionnaire, the first five questions focus on disability and later four questions target participation restriction. Similar to IOI-HA, it is a brief and comprehensive measure recommended by the American Speech-Language-Hearing Association (ASHA) for screening the hearing

disability in adults using hearing aids. SAC was one of the top five self-report measures used by audiologists in the United States.

These are only scales available in Kannada along with Participation scale and AQoL - 4D and these are the most used scales for outcomes in developed countries. These scales are interrelated to each other and it assesses in domains which are more concerned with daily activities which are hampered by hearing impairment.

1.1 Need for the Study

Now-a-days the issue concerning the quality of life is important in our society. Some people consider that the quality of life depends on the location while others are sure that it depends upon the individual himself and upon his/her goals in life. According to the statistical data, the location is one of the key factors that influence the quality of life. Urban and rural living have a lot of distinguishing features which influence the quality of life to a great extent.

Measuring hearing aid outcome is an important indicator of audiological rehabilitation (Cox et al., 2000; Dillon et al., 1999; Dillon & So, 2001). In a community, there is a need to assess the subjective outcome measures for successful benefit of hearing aid which makes the rehabilitation process more useful. Thus the questions mentioned below need to be answered

- What are the expectations of a client from hearing aids?
- Whether the use of hearing aid reduced his disability?
- Whether the aural rehabilitation provided is useful?
- Are we providing according to the needs of patient? Etc.

As lifestyle varies across these two societies expectations of person from aural rehabilitation also varies. Knowledge of the outcomes of different population helps the

audiologists to understand their expectations thereby guiding the audiologists in providing better rehabilitation.

There are only sporadic studies in the Indian context in this scenario. Hence the present study was taken up.

1.2 Aim of the study

The main aim of the study was to find the differences in outcomes of hearing aids and challenges in listening situations across rural and urban population. In addition, relationship between hearing aid use, listening situations and strata of society was examined.

1.3 Objectives of study

- To study the outcomes of hearing aid.
- To elicit the differences in outcomes of hearing aid across rural and urban population.
- To see how differently hearing aids benefit these populations
- To explore the needs and challenging listening situations in these units

Chapter 2

LITERATURE REVIEW

In a community, it's essential to assess the subjective outcome measures for successful fitting of hearing aid which makes the rehabilitation process more beneficial. Measuring hearing aid outcome is an important indicator of audiological rehabilitation (Cox et al., 2000; Dillon et al., 1999; Dillon & So, 2001). Satisfaction of hearing aid has been always related to the dimensions of appearance, cost, comfort, acoustic benefit and service (Cox and Alexander, 1999, Kochkin, 2000). 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 relate quality of life. Thus customization of rehabilitation services has become a major step in approaching successful rehabilitation. Hearing aid outcome measurement is a key aspect of aural rehabilitation (Cox et al., 2000; Dillon et al., 1999; Dillon & So, 2001). Very rarely a clinical program shall consists of all sorts of rehabilitation options with variety of hearing aids, educating clients about usage and strategies to adapt to hearing loss and giving necessary counselling and support to tackle emotional aspects of hearing loss that will be useful for the person with hearing loss. There are outcome measures that would describe about needs of patient there by audiologist can make use of this information to help and decide suitable aural rehabilitation procedures.

At an average there's long gap between hearing loss being detected and procuring hearing aid this gap is influenced by motivation and cost (Kochkin, 2008). And it's during this time users formulate expectations about what hearing aids will do for them and what it will be to wear a hearing aid (Saunders G H, 2009). It's observed that this gap is more in persons who are hailing from rural areas. This might be thought

to arise because of financial constraints and lack of awareness. Research has shown that these developed expectations affect reported outcome, hearing aid satisfaction, and the frequency of wearing hearing aid, factors like self-perceived handicap does also play a role (Weinstein, 1990; Humes et al, 2003; Helvik et al, 2006).

Growing concern in measuring hearing aid outcome measures in order to bring much satisfaction to hearing aid users has made researchers, supervisors, clinicians, financiers or insurance companies to document the outcomes of treatment in view point of patients. Benefit of hearing aid can't be assessed in one domain, for this assessment is done in multiple domains such as satisfaction, benefit, participation restriction, activity limitations etc. thus to achieve this many self-reported questionnaires are developed. A few among such questionnaires are listed below

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

Table 1 List of commonly used self-report outcome questionnaires.

Sl. No	Questionnaire	Authors	Year
a.	Hearing Handicap Scale (HSS)	High, Fairbanks, & Glogic	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
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But none of these self-report questionnaires can completely assess outcomes in all domains this situation forces us to use a battery rather than single questionnaire. In order to overcome this drawback, Cox, Hyde, Gatehouse, Noble, & Dillon, (2000) proposed an alternative approach. They developed a self-rating questionnaire to assess the hearing aid fitting outcomes, termed as the International Outcome Inventory for Hearing Aids (IOI- HA). The IOI- HA is proposed to be used as a supplement outcome measure along with the objective measures. The IOI-HA is an 8-item questionnaire aimed to assess the effectiveness of the hearing aid treatment. The eight items of the questionnaire covers a wide-range of subjective factors that complements well with the audiological objective measures that are used to evaluate the fitting success of hearing aid. Each item signifies a different outcome domain and has 5 response alternatives, where every single response ranges from the worst to the best outcome, and where higher scores indicate a better outcome. The IOI-HA is a questionnaire addressing the core dimensions of fitting outcome: (1) hearing aid usage, (2) benefit, (3) residual activity limitations, (4) satisfaction, (5) residual participation restrictions, (6) impact on others, and (7) quality of life. Dreschlerf & Festen (2002) found that “the IOI-HA consisted of two factors where factor one was represented by items 1, 2, 4, and 7 (daily use, benefit, satisfaction, & quality of life). These items could be summarized as the satisfaction variables, whereas the remaining items, factor two, more reflected issues such as residual participation restriction”.

Cox, Stephens, & Kramer (2002) studied the psychometric functions of IOI-HA. Through mail they administered the questionnaire on 260 adults with mean age of 72 years (range 26 to 98). Results indicated that less than 15% of people indicated less outcome scores. Here the authors have discussed if the IOI-HA should be treated as mini profile i.e., reporting each question separately and comparing with normative data? Or should it be summed and compared with overall scores? Or should it be scored for each factor separately?

Cox, Stephens, & Kramer (2002) concluded saying that mean option and simplest one to interpret the results would be in considering the overall total score. One disadvantage is that few important information might be lost while summing up. Cox & Alexander (2003) developed norms for IOI-HA, which are useful for both clinical and research purpose. In this study 154 subjects were involved. The authors have even studied the association between outcomes and demographic variables and evaluated the psychometric properties of IOI-HA and developed normative data in a Veteran sample. 131 male subjects with mean age of 74.3 years with SD 7.4 were selected for this. The participants were digital hearing aid users. Two set of questionnaires were mailed to the participants and were asked to fill one of them immediately and another after two weeks. The questionnaire's psychometric properties were assessed. As reported by Cox & Alexander (2003), their participants were divided into two categories based on pure tone audiometric thresholds i.e., none to moderate hearing loss and moderately severe and more hearing loss categories. The norms obtained were compared with original norms published by Cox & Alexander (2003). Results found good internal consistency and high test-retest reliability.

Newman & Weinstein (1986) studied the perception of hearing handicap by elderly men and their spouses using Hearing Handicap Inventory for Elderly (HHIE)

they administered on thirty hearing impaired subjects. They gave 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 problem 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.

Schum (1992) administered Hearing Aid Performance Inventory (HAPI) which has 64 items on 158 subjects (65 to 80 years) to assess benefits from hearing aid and to develop normative data for older individuals. Results reported that elderly individuals reported less benefit than younger individuals from their original normative study for the same measures. Here degree of hearing loss, style of hearing aid didn't influence outcome rather the outcomes were influenced by duration of hearing aid usage per hour and number of days of use.

Vanaja (2000) developed a questionnaire for self- assessment of hearing handicap for Indian scenario. It assesses the hearing handicap of individuals in various situations such as familiar/unfamiliar, noisy/quiet, with/without visual clue. It consisted of fifty questions and a three point rating scale was used. Rating was used 3 from most of the time to 0 seldom. Results showed good correlation of self-perceived scores with the speech identification scores in quiet and noisy condition. It can be very helpful to predict degree of hearing loss.

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. S Gatehouse, W Noble (2004), mentioned that HHQ is reported to be having good Cronbach's alpha (internal consistency) for both the emotional (0.95) and social scale (0.93).

Uriarte, Denzin, Dunstan, Sellars, & Hickson (2005) conducted study for older hearing aid users of Australia using Satisfaction with Amplification in daily life (SADL) questionnaire with mean age of 75.32 years in comparison 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 priority. It was found that degree of hearing loss, type of hearing aid and style of hearing aid used were variables responsible for satisfaction of hearing aids.

Hodes M, Schow R, Brockett J (2009) conducted a study with the goal of determining important statistical properties of the 2007 computerized SAC and SOAC scales. Authors were able to show that the computerized SAC and SOAC scales have similar mean scores, SDs, and high Cronbach alpha and test-retest correlations. This means that an individual who is given the computerized SAC or SOAC would be expected to score approximately the same on both test and retest if given the questionnaire a second time within a relatively short period of time (a few weeks). This is, of course, assuming that their hearing status has not changed, as was the case with

the current participants. SAC was one of the top five self-report measures used by audiologists in the United States (Millington D, 2000)

Smith SL et al in 2009 in their study on evaluating IOI HA for veterans observed in their study that factor analysis showed that the IOI-HA in the veteran sample had the identical subscale structure as reported in the original sample. For the total scale, the internal consistency was good (Cronbach's $\alpha = 0.83$), and the test-retest reliability was high ($\alpha = 0.94$). Group and individual norms were developed for both hearing difficulty categories in the veteran sample. For each IOI-HA item, the critical difference scores were <1.0 . This finding suggests that for any item on the IOI-HA, there is a 95 percent chance that an observed change of one response unit between two test sessions reflects a true change in outcome for a given domain. They concluded that the results of this study confirmed that the psychometric properties of the IOI-HA questionnaire are strong.

In dissertation by Maithri N (2015), where the aim of study was to translate, standardize and validate the English version of IOI-HA questionnaire in Kannada it was found from their study that the individuals with hearing impairment had difficulties while communicating without their hearing aids and all were highly depending on their hearing aids. Spearman's correlation test was performed and it was found that out of all items related to outcome of hearing aid the most and least representative of the questionnaire were second and first question respectively. There was significant correlation among other questions with $p < 0.01$. Second question is Think about the situation where you most wanted to hear well, before you got your present hearing aid(s). Over the past two weeks, how much has the hearing aid helped in that situation? First question is Think about how much you used your present hearing aid(s) over the past two weeks. On an average day, how many hours did you use the hearing aid(s).

Thammaiah et al in 2016 observed in their study that there was 71% variance in scores of Kannada version of HHQ in exploratory factor analysis. The internal consistency measured with Cronbach's alpha was 0.96. The test-retest reliability correlations of the Kannada version with the English and with the same Kannada version re-administered after 15 days were 0.96 and 0.91, respectively. Convergent validity of the scale was confirmed by significant correlations with the Participation Scale and the Assessment of Quality of Life scales. Discriminant validity was found to be low as all the Kannada-HHQ questions were highly correlated with each other ($r=0.60$). No floor and ceiling effects were identified. They concluded that the psychometric properties of the Kannada-HHQ scale are considered to be adequate for clinical or research use.

According to recent Socio Economic and Caste Census (SECC) data around 73 per cent of households in India are set up at rural areas. The data given by Ministry of Rural Development, Panchayat Raj and Drinking Water Supply and Sanitation, Government of India says 74.5% of rural households have an income of the highest earning member below Rs 5000 per month. Only 8.3% of rural households have an income of the highest earning member above Rs. 10,000 per month. India's per capita income (nominal) was \$10,500 in 2013, ranked at 12th out of 164 countries by the World Bank. Towns and cities make more than two thirds of the Indian GDP, even though less than a third of the population live in them. Making towns giving better living conditions and facilities and better access to health care. The main reason for rural India's poor performance in terms of income is the fact that rural India is mostly dependent on agriculture. The agriculture sector in India grew at a rate of only 1.6% in 2008-09, while the Indian Economy grew at a rate of 6.7%, An extremely slow rate of growth in the agriculture sector of the Indian economy has serious implications for the

rural-urban divide, both in terms of income and GDP. Some estimates say that the average income of a person living in an urban area may be up to 4 times higher than that of a person living in a rural area. The per capita income available is for year 2011-12 in the country for urban areas was Rs. 1, 01,313 and for rural areas it was Rs. 40,772, (Ministry of Finance, GoI, 2011-12).

Milind Deogaonkar, 2004 in their study observed that there are profound effects on health of a society due to persistent social and economic inequality. The unequal distribution of resources is a reflection of this inequality and this will affect healthcare of underprivileged population adversely. The reasons for inaccessibility to socio economically underprivileged are geographical, social, economic or gender related distances.

Brian J.L. Berry and Adam Okulicz-Kozaryn (2011) based on data collected by the General Social Survey from 1972 to 2008 in United States of America there is a gradient of subjective wellbeing or happiness across rural and urban areas. This gradient rises from its lowest levels seen in large central cities to its highest levels observed on the small town/rural periphery.

Abhay Mudey et al (2011) showed that the quality of life of elderly people was better in rural was better in psychological domains in comparison to urban units and better quality of life was seen in urban slum dwellers in in social relationship and environmental domain. And the difference between the quality of life in rural and urban elderly population is due to the difference in the socio-demographic factors, social resource, lifestyle behaviors and income adequacy.

The economic status of Bengutia, Bhirbhum district in West Bengal was found to be lesser than that of urban units (Biswajeet Saha, 2015). The Socio- economic and

nutritional status of women is directly connected with their economic position, which in turn depends on opportunities for participation in economic activities and economic activities in rural parts are fewer and much restricted to agriculture (Aicha M et al, 2014). In another study by Himansu Sekhar Patra et al, (2015) it was observed that level of education and economic status was found to be less. In a study by Md Monirul Islam et al (2014) observed that the, education, income and quality of life was poorer than urban units. A dissertation study by Vishnu Kumar Nama in Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka it was observed that there is significant differences between quality of life among elderly adults of selected rural and urban units.

In a study by Debalina Datta et al (2015) observed in their study that the quality of life in elderly people is directly associated with demographic factors and socio economic status of individuals. Gambin G et al (2015), in their study on quality of adults from rural part of southern Brazil reported that higher overall quality of life ratings of older adults was associated with income and lower number of morbidities. Ashok Vikhe Patil et al (2002) observed in their study that rural areas have poor healthcare facilities, limited infrastructure, limited funding and suffers from lack of adequate qualified manpower.

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 status (not employed, part time, and full time) did contribute in satisfaction and outcomes significantly nor the socio economic status (Jerram and Purdy, 2001). 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. 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. 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. In a study by Humes et al (2003) it was 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. Tsakiropoulou E et al (2007) mentioned in their study that patient's social and economic status have 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 in order required for better satisfaction and outcomes from the hearing aid (Saunders GH, Lewis MS, Forsline A, 2009). 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.

Nevertheless low correlation coefficients studies have reported that experienced users have showed 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 unexperienced 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 may not 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 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 had more satisfaction with appearance of the aid. So by inferring these studies the subjects with minimum experience of 3 months are chosen for the study.

Chapter 3

METHODOLOGY

The study was conducted to find the differences in outcomes of hearing aids and challenges in listening situations across rural and urban population. In addition, relationship between hearing aid use, listening situations and strata of society was also examined.

3.1 Participants:

Inclusion criterion

- Total of 200 subjects with acquired hearing loss ranging from moderate to severe hearing loss of sensorineural and mixed types were considered for the study
- Individuals using digital behind the ear hearing aid/s at least for three months were chosen.
- Aided speech identification scores of the participants were at least 60%.
- Age range of participants were 18 to 59 years which were divided in two units, individuals residing in the rural and urban set-ups.
- Irrespective of their native area, individuals living in urban/rural area for more than a year were considered to be hailing from area where they are currently living.

Definition of rural and urban areas as per Registrar General & Census Commissioner, Ministry of Home Affairs, Government of India, New Delhi, IN.

Urban areas (2011):

- All places with a municipality, corporation, cantonment board or notified town area committee, etc.
- All other places which satisfied the following criteria
 - A minimum population of 5,000;
 - At least 75 per cent of the male main workers engaged in non-agricultural pursuits; and
 - A density of population of at least 400 per sq. km.

Rural areas (2011):

All other areas or places which does not fall under urban units are classified as rural areas.

Exclusion criterion

- Naive hearing aid users were not considered for the study
- Individuals with congenital hearing loss were excluded.
- Individuals who had other co morbid disorders like tremors, psychological problems were not considered.

3.2 Procedure:

- The information collection involved the survey through personal and telephone interviewing procedure.
- Subjects were selected from different audiological set-ups such as national level institute funded by Government of India, private clinics and private institutions to avoid biasing.
- Study was done in Mysore and its surroundings using cross sectional study design.

- Kannada version of HHQ4, IOI-HA5 and SAC6 were administered by the researcher himself.
- This was done either through personal interview or through telephone interview.
- Two units were made based on their place of residence, units consisting of hearing aid users henceforth called as urban units and rural areas units, each group consisted of 100 Kannada speaking adult individuals giving a total population of 200 subjects.

Chapter 4

RESULTS & DISCUSSION

This study was carried out to explore the differences if any in challenging situations in hearing and differences if any in hearing aid outcomes across rural and urban population using Kannada adaptation of Hearing Handicap Questionnaire (HHQ) Patients self-assessment of communication (SAC) and International Outcome Inventory for Hearing Aid (IOI-HA) from English. The participants of the study were Hearing impaired Kannada speaking adult individuals hailing from rural and urban units. A total of 200 individuals with an age range of 18 years to 59 years participated in the study.

HHQ (Hearing Handicap Questionnaire) is a questionnaire to measure hearing disability as per the guidelines of WHO. It is a questionnaire with 12 questions and scored on 5 point rating scale from never to almost always as a response option, left being never experienced difficulty to right being always experienced difficulty. For questions from 2 -12 higher the score is indicative of higher degree of being handicapped or difficulty experienced, question 1 is indicative of awareness and higher is the score, better is the awareness. Questions 1-7 are concerned with emotions of hearing impaired individual and Questions 8 to 12 are concerned with interaction of hearing impaired with society.

IOI-HA (International Outcome Inventory for Hearing Aid) is a questionnaire which has 8 questions, providing the outcomes of hearing aid usage. Each item of first seven questions has been scored from 1 to 5 for the responses being left (worst) to right

(best) respectively excluding the eighth question which was scored from 1 to 5 for the responses being right (worst) to left (best) respectively. For first 7 questions the higher score is indicative of a better outcome and for the 8th question better outcome is indicated by the lowest score.

SAC (Self-Assessment of Communication) is a questionnaire which assesses the benefits of hearing aid fitted on hearing impaired individual. It has 12 items with each being scored on 5 point rating scale with responses on right indicating poor outcome and right indicating better except for question number 9, 11 and 12. Question number 9 better the score carries better peer support (scores on right side are indicative of better peer support). In question number 11 and 12 more are the scores on right side better are the responses.

Responses obtained from questionnaires were subjected to item-wise statistical analysis using IBM SPSS software (version 23). To see the response distribution across the examined population for each item of the questionnaire descriptive (frequency) analysis was done. Chi-squared test was administered to find out the association between each item and experimental groups. 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 were analysed to cover the two objectives of the study. To explore the differences in challenges in listening situations and differences in outcomes of the hearing aids among urban and rural population under these sections.

1. To observe the differences in handicap experienced by individuals hailing from rural and urban areas.

2. To observe the differences and similarities found in outcomes of the hearing aid usage among individuals and association of rural and urban units with the hearing aid outcomes.
3. To see the differences in self-assessment of communication between rural and urban dwellers

i. Differences in perceived handicap

4.1.1 Question 1

This question reports how much difficulty the individual experiences (Figure 4.1). Of the participants of the study 13.0% reported response as sometimes which constituted 30.8% urban and 69.2% rural population. 42.5% reported response as often among them 45.9% were urban and 54.1% were rural population. 44.55 reported as almost always in which 59.6% were urban and 40.4% were rural population. There's a significant difference ($p < 0.05$) between urban and rural group in this aspect. The results of present study indicate that participants from urban units are more aware of their hearing difficulties than the ones from rural. The estimated prevalence of adult onset hearing loss in India was found to be 7.6% (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. Loss in urban and rural areas were 9% and 10% respectively. Number of persons with hearing disability per 100,000 was found to be 291: it was found to be higher in rural areas (310) in comparison with urban areas (236). Though the hearing impairment is more prevalent in rural settings overall awareness about hearing difficulty was more seen to be in urban settings. This might be due to less demanding socio economic activities compared to urban settings (Bulderberga. Z, 2011). Urban settings have shown intensive socio

economic activities (Pateman, T. 2011) which demands an individual to be more interactive. This taxes on his senses where he/she will have to communicate with the society more often than in rural settings. Increased social contact, nature of working which mainly involves interaction with co-workers more number of service and manufacturing industries (Ghani, E., 2012) and nuclear families makes an individual more susceptible to listen and communicate. Also difficulties in listening due to traffic noise, construction noise and social noise are more prevalent in urban settings. In contrast in rural settings where individuals mainly involve in agricultural activities than manufacturing and service activities which doesn't demand much of individual's communication unlike in urban. Difficulties in listening due to traffic noise, construction noise and social noise is less compared to urban settings. Because of these factors individuals from rural settings have less demanding listening situations thereby making them unaware of their losses or difficulties. There's lag between identification of hearing loss and fitting hearing aids, it is believed that during this interval users formulate expectations about what hearing aids will do for them and how it will be to wear a hearing aid (Saunders G H, 2009). It's observed that this gap is more in persons who are hailing from rural areas. Research has shown that these developed expectations affect reported outcome, hearing aid satisfaction, and the frequency of wearing hearing aid (Weinstein, 1990; Humes et al, 2003; Helvik et al, 2006). Urban dwellers have more access to internet through which they can understand more about their problems and possible solutions. These people can search over internet for types of hearing loss, possible causes, varieties of hearing aids, audiological clinics. Also there are a few websites which claim to tele assess/screen hearing acuity. These possibilities boosts the awareness and knowledge about hearing difficulties. Urban India with an estimated population of 444 million already has 269 million (60%) using the Internet. Rural India,

with an estimated population of 906 million as per 2011 census, has only 163 million (17%) Internet users (Internet and Mobile Association of India 2014-15).there are potential approximately 750 million users still in rural India who have no access to internet thereby limiting them in acquiring knowledge about these aspects. Lack of education, healthcare, higher myth and misconceptions regarding hearing loss (Manjunath Y N, 2014) also contribute to make people less aware of their problems. 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 which highly prevalent among rural population.

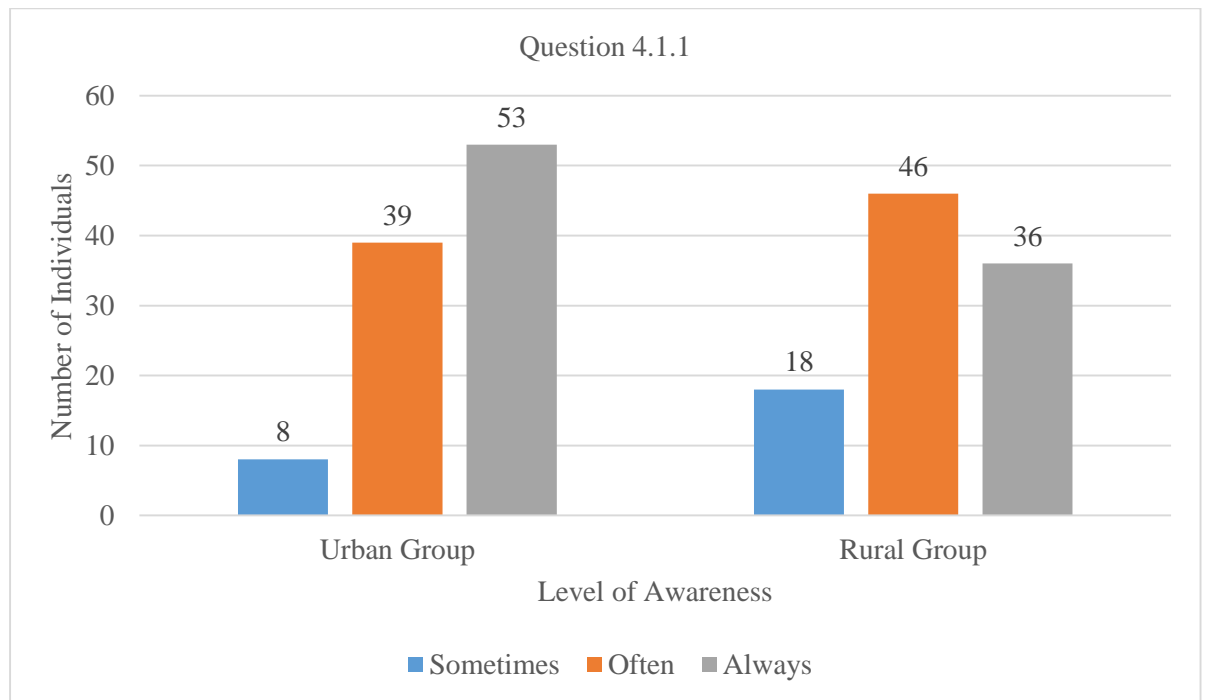


Figure: 4.1.1 Frequency distribution for Question 1 (awareness) in number of individuals.

4.1.2 Question 2

This question says about level of nervousness or being uncomfortable due to hearing impairment by individuals themselves (Figure 4.2). Total of 5.0% reported as

never among which 100% were from rural population. 25.0% reported as rarely among that 42.0% were from urban and 58.0% were from rural population. 44.5% reported as sometimes in which 57.3% were urban and 42.7% were rural population. 25.5% reported as often in which 54.9% were urban and 45.1% were rural population. Results show that problem of feeling nervous or being uncomfortable due to hearing impairment was significantly ($p < 0.05$) less among rural dwellers. As discussed earlier this might be due to differences present urban and rural settings in living style, working, demands from society, living environment (Mudey, A., et al, 2011) makes rural inhabitants be lesser uncomfortable and nervous.

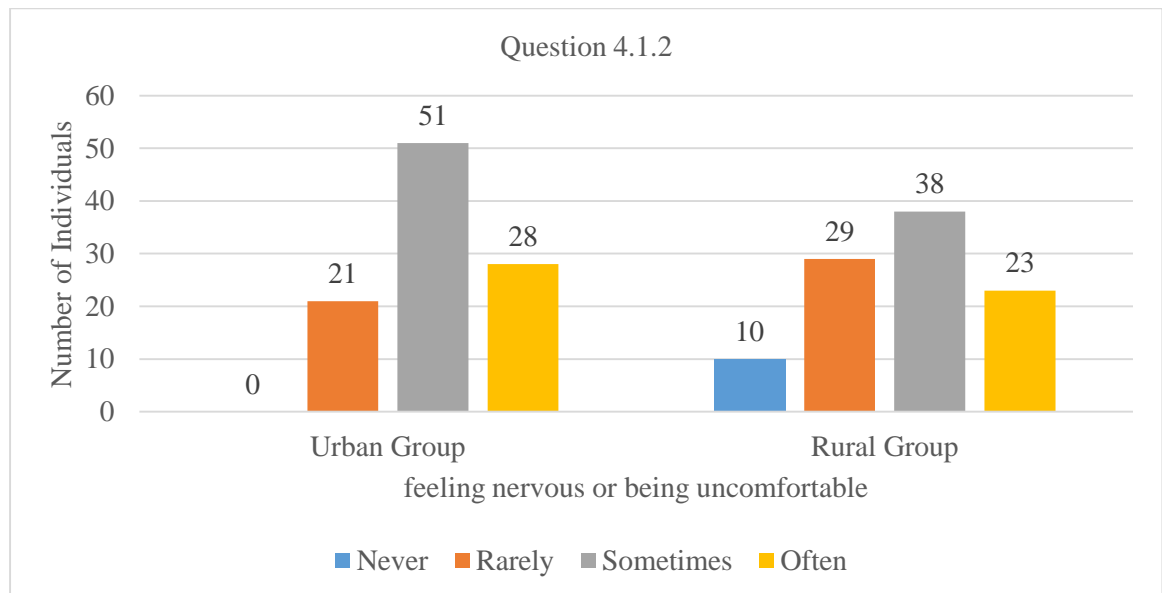


Figure: 4.1.2 Frequency distribution for Question 2 (anxiety) in number of individuals.

4.1.3 Question 3

This questions deals about the effect of hearing impairment on individual's confidence level (Figure 4.3). Total of 17.5% reported as rarely in which 40.0% were urban and 60.0% were rural population. 45.0% reported as sometimes among which 42.2% were urban and 57.8% were rural population. 37.5% reported as often in that

64.0% were urban and 36.0% were rural population. The confidence level was significantly affected majority of times in urban participants than the rural participants ($p < 0.05$). Urban population are bound to work in demanding situations where they are expected to communicate more. Failure to communicate causes them to perform less which in turn can affect their incentives and benefits from workplace. It becomes difficult to perform their fullest. As mentioned before due to economic and social activities which separates the urban hearing impaired from mainstream making his confidence level to go down. Perhaps higher cost of living in urban settings also affects the impaired individual's confidence. This can be more if impaired individual is the bread winner of family. As seen in results, rural dwellers also suffer from affected confidence levels but not much often as urban dwellers. It's obvious that any deficit or deviance in health will affect the confidence of an individual. 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).

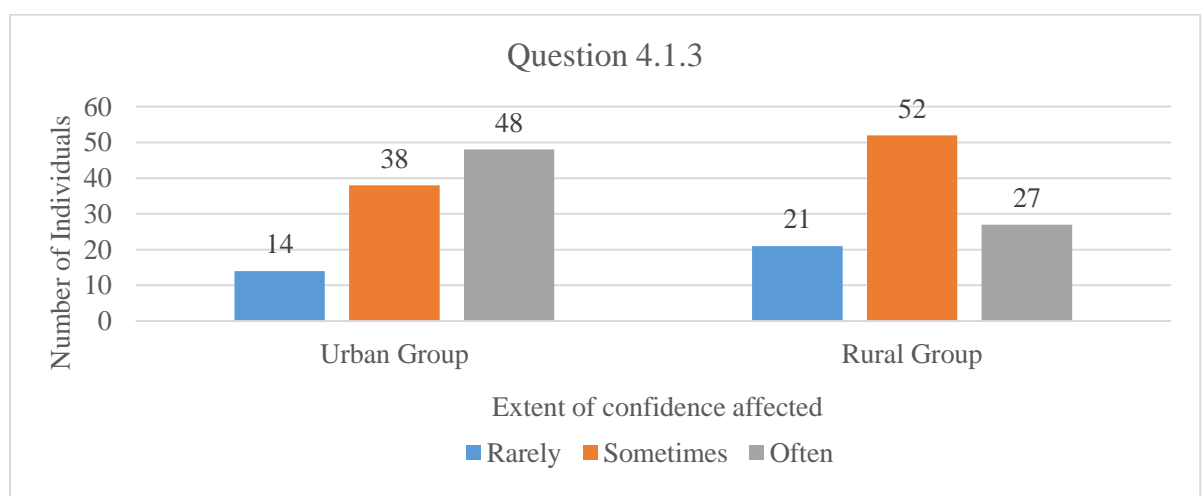


Figure: 4.1.3 Frequency distribution for Question 3 (affected confidence) in number of individuals.

4.1.4 Question 4

This question points towards how often hearing difficulty affects the way how hearing impaired feels towards himself (figure 4.4). Among total participants 18.5% reported never as answer in that 45.9% were urban and 54.1% were rural population. 43.0% reported as rarely, in that 46.5% were urban and 53.5% were rural population. 24.0% reported as sometimes, in that 45.8% were urban and 54.2% were rural population. 14.5% reported as often, in that 72.4% were urban and 27.6% were rural population. None of the participants in either population reported as almost always. There was no significant differences between urban and rural participants ($p>0.05$). Hearing impairment brings about multiple negative outcomes as its consequence such as altered self-esteem, diminished functional status and loneliness, depression (Chen, 1994; Dugan & Kivett, 1994; Jerger, Chmiel, Wilson, & Luchi, 1995; Mulrow et al., 1990; Wallhagen, Strawbridge, & Kaplan, 1996). This in turn affects the way how impaired feels towards himself. This emotional aspect of hearing impaired had affected irrespective of where the individuals are hailing from. On observing responses from urban group we can notice that similar number of participants have reported hearing difficulties have affected at different frequencies rarely affected being more. This indicates that within urban group there are people with varying sensitivity to hearing difficulties.

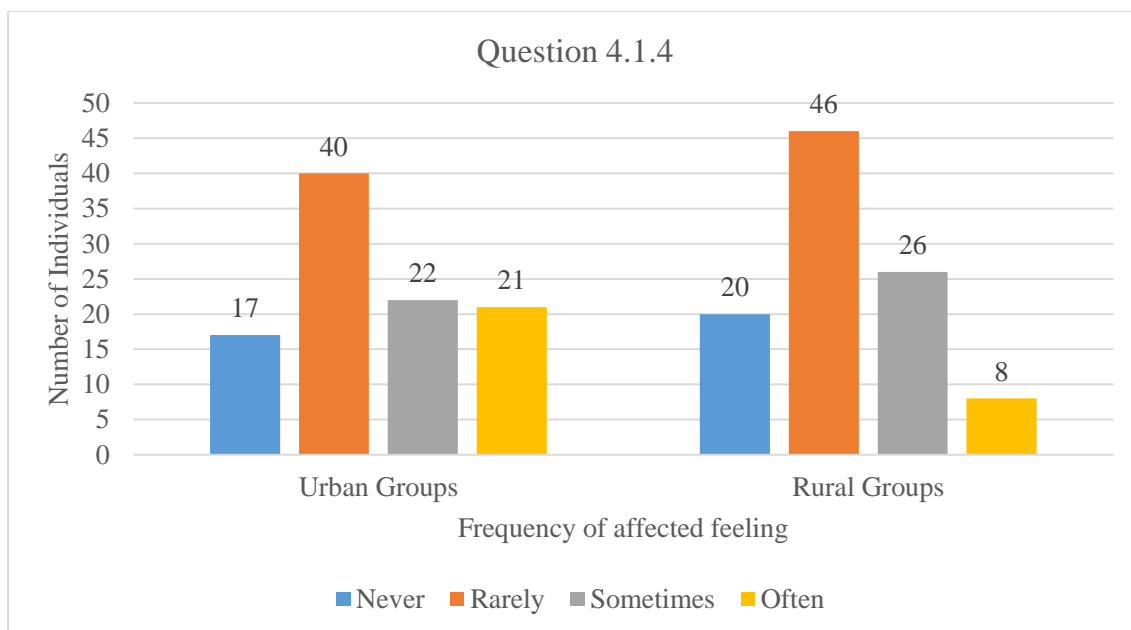


Figure: 4.1.4 Frequency distribution for Question 4 (affected feeling towards themselves) in number of individuals.

4.1.5 Question 5

This question addresses about how often does the individual feels worried or become anxious because of hearing difficulty. Among total participants 8.0% reported never as answer in that 18.8% were urban and 81.3% were rural population. 30.0% reported as rarely, in that 25.0% were urban and 75.0% were rural population. 38.0% reported as sometimes, in that 59.2% were urban and 40.8% were rural population. 24.0% reported as often, in that 77.1% were urban and 22.9% were rural population. None of the participants in either population reported as almost always. There is a significant difference between the two group ($p < 0.05$). Urban population feels more worried or become anxious because of hearing difficulty than rural population. Larger number of anxious individuals in urban settings can be associated with differences in lifestyle among urban and rural dwellers. One such factor is traffic which is less in rural areas, it becomes difficult for a hearing impaired individual to move freely in traffic

congested areas leading to increased anxiety. Affected mental and physical functions due to hearing impairment (Strawbridge, W. J et al 2000) especially one living in intense socio economic activities makes more anxious. Common belief among rural people is hearing impairment is indicator of ageing and frailty (Stark, P., & Hickson, L. 2004). They tend to accept this as course of nature which can be reason for lesser anxiety among rural dwellers and also lesser communication situations and demands unlike urban setting.

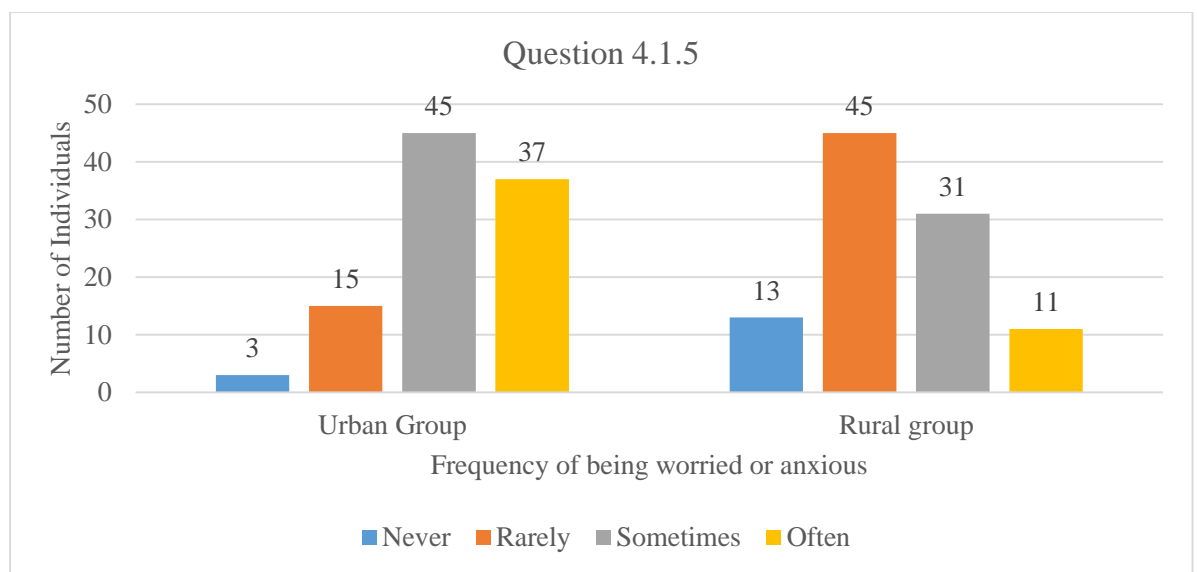


Figure: 4.1.5 Frequency distribution for Question 5 (feeling worried or anxious) in number of individuals.

4.1.6 Question 6

This question reports about how often the individual gets embarrassed because of his hearing difficulty when he is in the company of people (figure 4.6). Among total participants 5.0% reported never as answer in that 40.0% were rural and 60.0% were urban population. 12.5% reported as rarely, in that 64.0% were rural and 36.0% were urban population. 30.0% reported as sometimes, in that 63.3% were rural and 36.7% were urban population. 44.0% reported as often, in that 35.2% were rural and 64.8%

were urban population. 8.5% reported as almost always, in that 64.75 were rural and 35.3% were urban population. The participants from urban group experienced embarrassment significantly more than rural participants ($p < 0.05$). As discussed earlier nature of lifestyle, mental status, functional status, demands from society and work place could have influenced this.

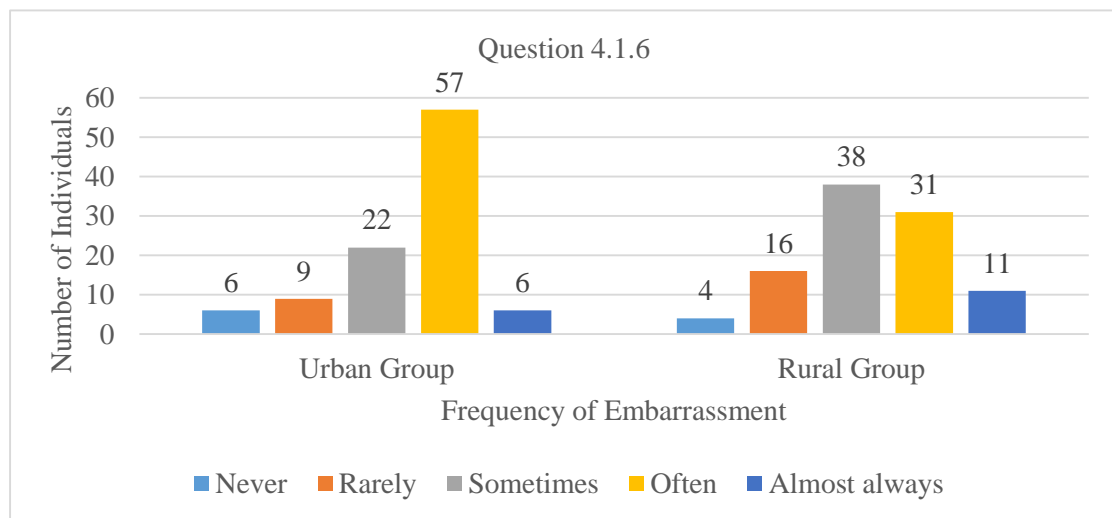


Figure: 4.1.6 Frequency distribution for Question 6 (feeling embarrassed) in number of individuals.

4.1.7 Question 7

This question reports about how often the individual felt tense and tired because of his hearing difficulty (figure 4.7). Among total participants 35.5% reported never as answer in that 52.1% were urban and 47.9% were rural population. 49.5% reported as rarely, in that 46.5% were urban and 49.5% were rural population. 11.5% reported as sometimes, in that 60.9% were urban and 39.1% were rural population. 3.5% reported as often, in that 42.9% were urban and 57.1% were rural population. None of the participants in either population reported as almost always. There was no significant

association seen between the two populations about how often they felt tense and tired because of his/her hearing difficulty ($p>0.05$). Majority of participants have reported to be rarely experiencing tired or tensed feeling. Across both the groups demographic factors did not influence this parameter.

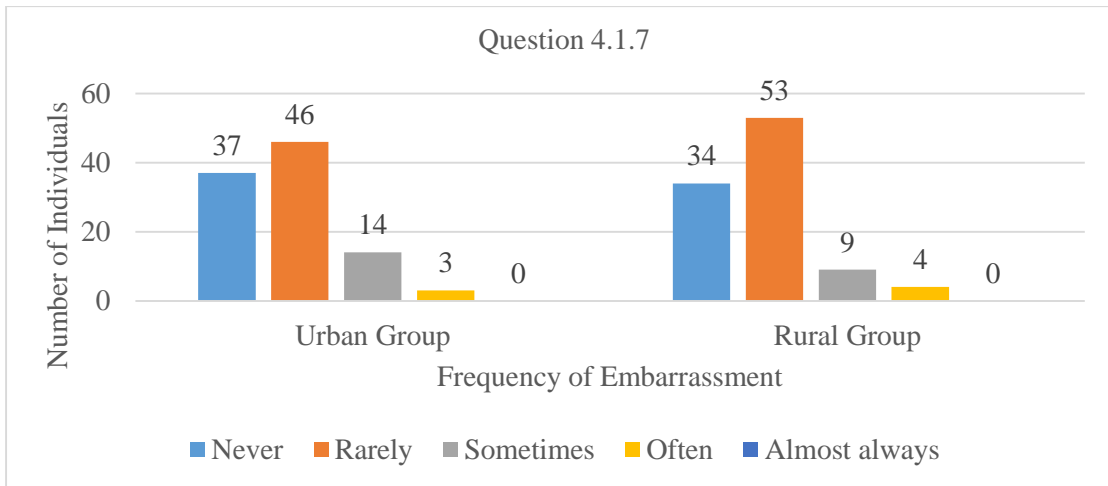


Figure: 4.1.7 Frequency distribution for Question 7 (feeling tense and tired) in number of individuals.

4.1.8 Question 8

This question reports about how often does his/her hearing difficulty restrict the things he/she does (figure 4.8). Among total participants 0.5% reported never as answer in that 100% were rural population. 12.5% reported as rarely, in that 12.0% were urban and 88.0% were rural population. 29.5% reported as sometimes, in that 28.8% were urban and 71.2% were rural population. 39% reported as often, in that 61.5% were urban and 38.5% were rural population. 18.5% reported almost always in that 86.5% were urban and 13.5% were rural population. It was found that participation restriction was significantly higher in urban than rural population ($p<0.05$). As discussed before due to differences in living style, environment and socio economic activities in rural participants has made them to feel less restricted in his/her activities. People living in

rural settings mainly involve in agriculture and other minor economic activities (SECC, Ministry of Rural Development Govt. of India, 2011) which does not tax on hearing. Consider working in an urban market place or factory which requires continuous exchange of dialogs with others and working in rice fields which requires a little of listening situations. Hence, a farmer in this situation does not feel much restricted as of a merchant selling goods in some busy market or a factory worker working in noise and who is expected to communicate with his colleagues.

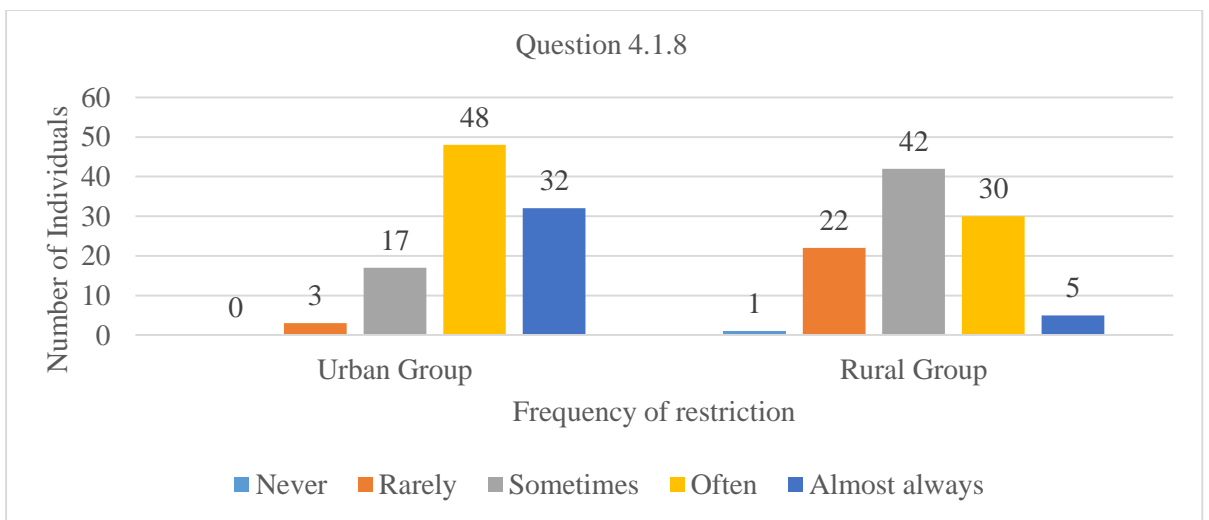


Figure: 4.1.8 Frequency distribution for Question 8 (restriction of things he/she does) in number of individuals.

4.1.9 Question 9

This question reports about how often the individual is inconvenienced by his/her hearing difficulty (figure 4.9). Among total participants 1.5% reported never as answer in that 100% were rural population. 23.5% reported as rarely, in that 23.4% were urban and 76.6% were rural population. 37.5% reported as sometimes, in that 40.0% were urban and 60.0% were rural population. 29.5% reported as often, in that 72.9% were urban and 27.1.0% were rural population. 8.0% reported almost always in that 100.0% were urban population. It was found that participation restriction was

significantly higher in urban than rural population ($p < 0.05$). Underlying differences in functioning of urban and rural societies can be reasons for this difference in participation restrictions. Participation restriction is also present in rural setups sometimes that is about 50% of times on a 5 point rating scale which means rural dwellers also experience restrictions in their activities as hearing impairment affects physical and mental functioning of impaired individuals (Strawbridge, W. J et al 2000).

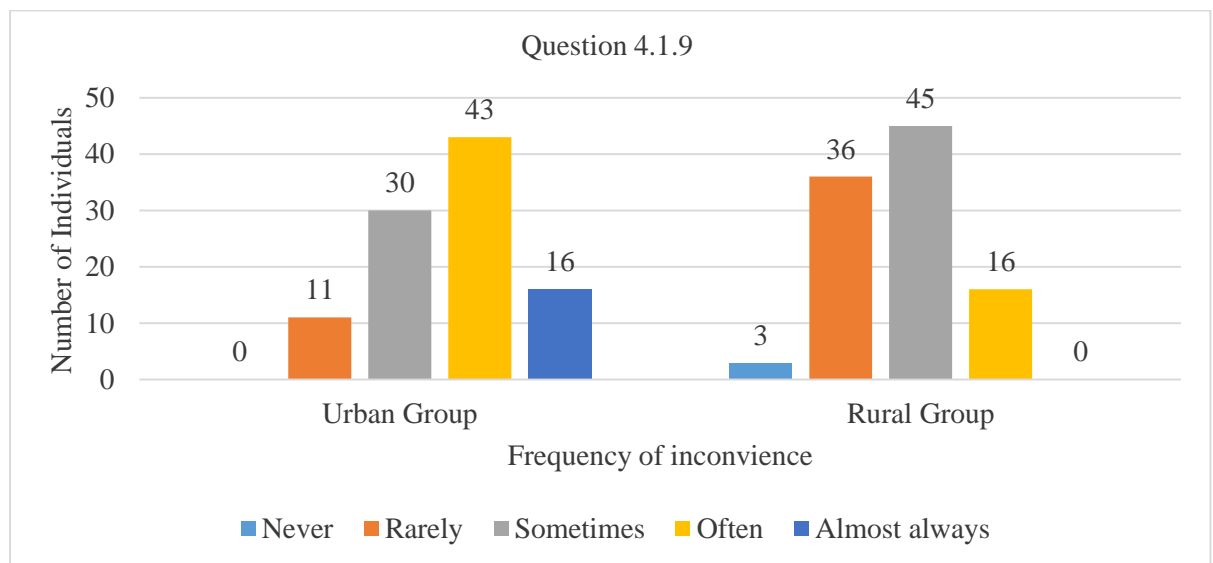


Figure: 4.1.9 Frequency distribution for Question 9 (inconvenienced by his/her hearing difficulty) in number of individuals.

4.1.10 Question 10

This question reports about how often the participant feels inclined to avoid social situations because of his/her hearing difficulty (figure 4.10). Among total participants 4.0% reported never as answer in that 25.00% were urban and 75.0% rural population. 18.5% reported as rarely, in that 27.0% were urban and 73.0% were rural population. 39.5% reported as sometimes, in that 46.8% were urban and 53.2% were rural population. 32.5% reported as often, in that 61.5% were urban and 38.5% were rural population. 5.5% reported almost always in that 100.0% were urban population.

It was found that urban population inclined to avoid social situations and it was significantly higher than rural population ($p < 0.05$). Hearing impairment causes reduction in self-esteem, self-confidence and the way how impaired person feels towards himself and brings many negative outcomes (Chen, 1994; Dugan & Kivett, 1994).

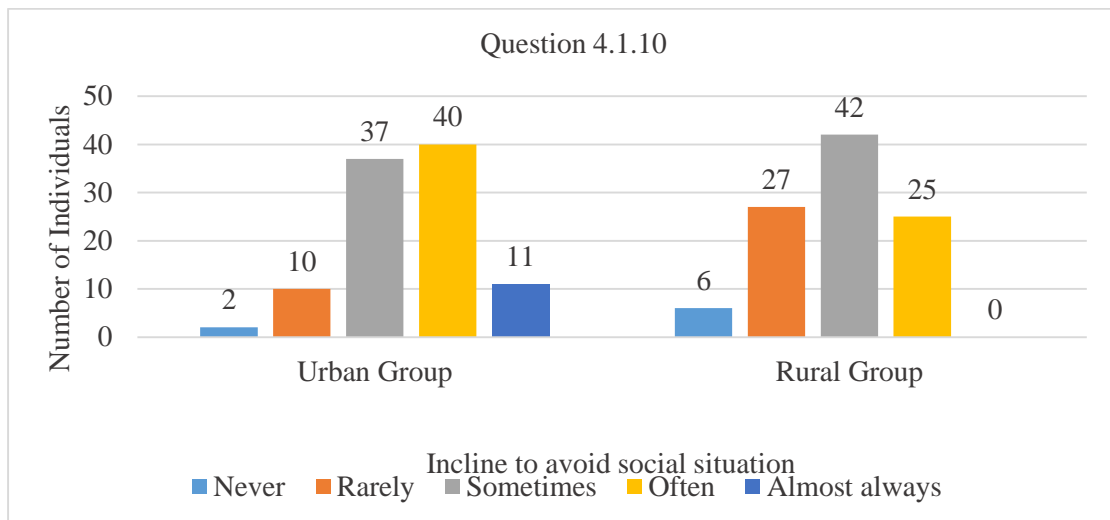


Figure: 4.1.10 Frequency distribution for Question 10 (feel inclined to avoid social situations) in number of individuals.

4.1.11 Question 11

This question reports how often does his/her hearing difficulty restrict their social or personal life (figure 4.11). Among total participants 18.0% reported as rarely, in that 47.2% were urban and 52.8% were rural population. 40.5% reported as sometimes, in that 38.3% were urban and 61.7% were rural population. 30.5% reported as often, in that 55.7% were urban and 44.3% were rural population. 11.0% reported almost always in that 81.8% were urban and 18.2% were rural population. It was found that in urban population hearing difficulty restricted their social or personal life more and it was significantly higher than rural population ($p < 0.05$). Restricted social and

personal life is more among urban dwellers than that of rural populations, reason could be the same as of above situations. A large number of rural participants also encounter with restricted personal and social life but this is sometimes unlike urban population who face much often or always. Decreased self-esteem, negative thoughts, depression, reduced mental functioning due to hearing difficulties (Chen, 1994; Dugan & Kivett, 1994) could have contributed to this issue.

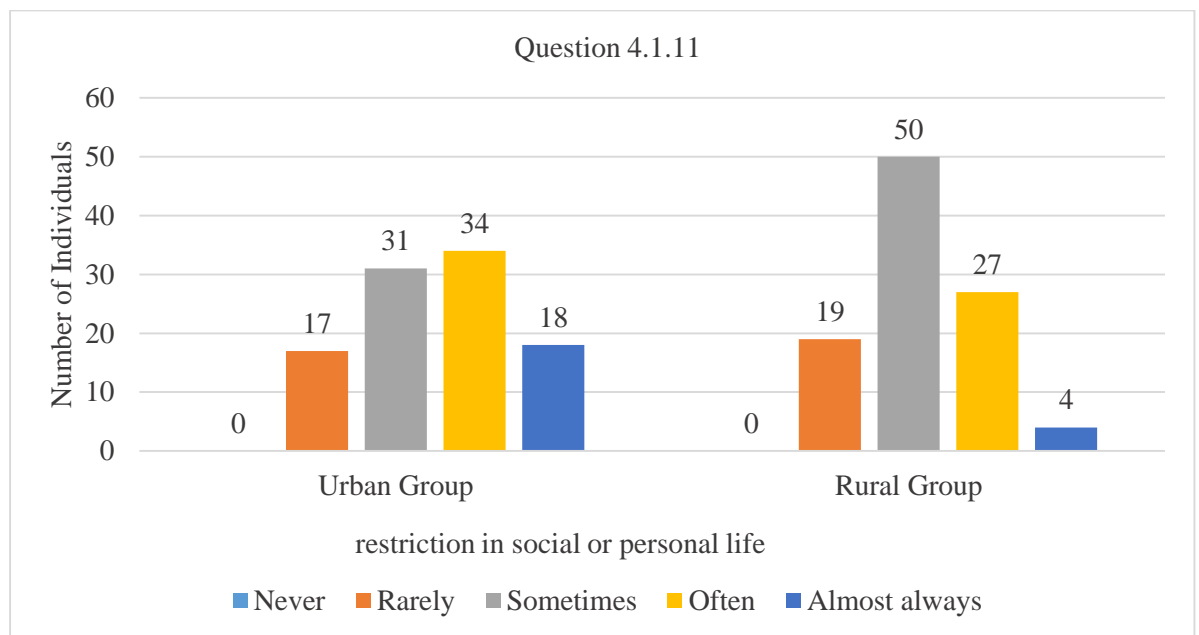


Figure: 4.1.11 Frequency distribution for Question 11 (restriction in social or personal life) in number of individuals.

4.1.12 Question 12

This question reports about how often individuals feel cut-off from things because of their hearing difficulty (figure 4.12). Among total participants 10.0% reported never as answer in that 30.0% were urban and 70.0% rural population. 8% reported as rarely, in that 31.3% were urban and 68.7% were rural population. 64.5% reported as sometimes, in that 53.5% were urban and 46.5% were rural population. 17.5% reported as often, in that 57.1% were urban and 42.9% were rural population.

Neither of the group reported as almost always as answer for this question. There was no statistical significant difference among urban and rural participants ($p>0.05$). Participants from both group equally felt that sometimes they were cut off from other things. Though there was no significant difference more participants of urban had feeling of being cut off sometimes and often.

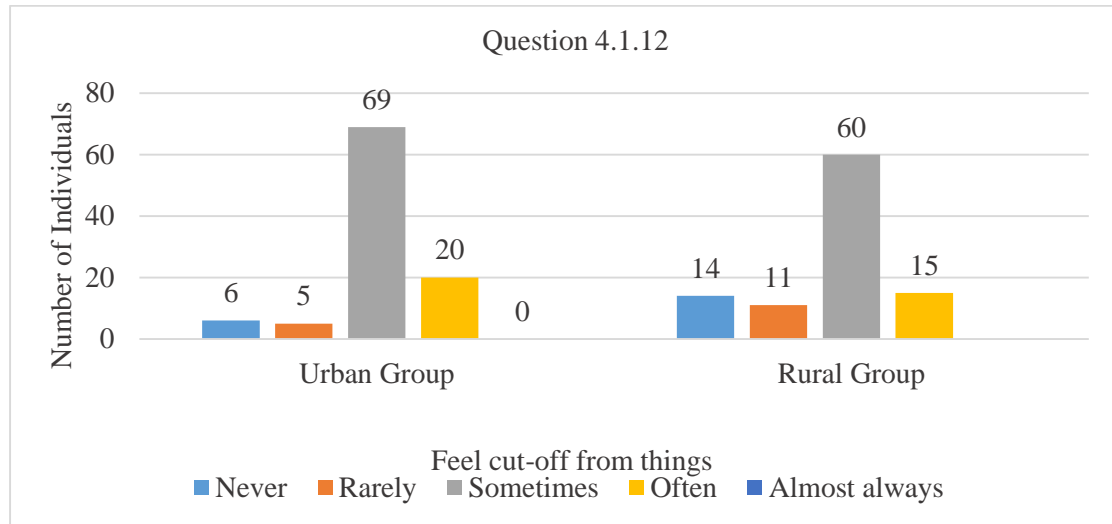


Figure: 4.1.12 Frequency distribution for Question 12 (feel cut-off from things) in number of individuals.

ii. Differences and similarities found in outcomes of the hearing aid usage

4.2.1 Question 1

The 1st question reports about the average number of hours the hearing aid was used in a day. The findings of the present study indicate (figure 4.2.1) total of 2.5% used hearing aid/s for 1 to 4 hours a day in which 20.0% were urban and 80.0% were rural population. 35.0% used hearing aid/s for 4 to 8 hours a day among them 54.3% were urban and 45.7% were rural population. 62.5% used hearing aid/s for more than 8 hours per day in that 48.8% were urban and 51.2% were rural population. There is no significant difference between the two groups on the number of hours hearing aid/s is

used ($p>0.05$). Slightly more number of rural participants have reported that they use hearing aids for 1-4hrs/day which may be because of negligence or difficulty to manage hearing aids due to restrictions in their activity or financial aspects.

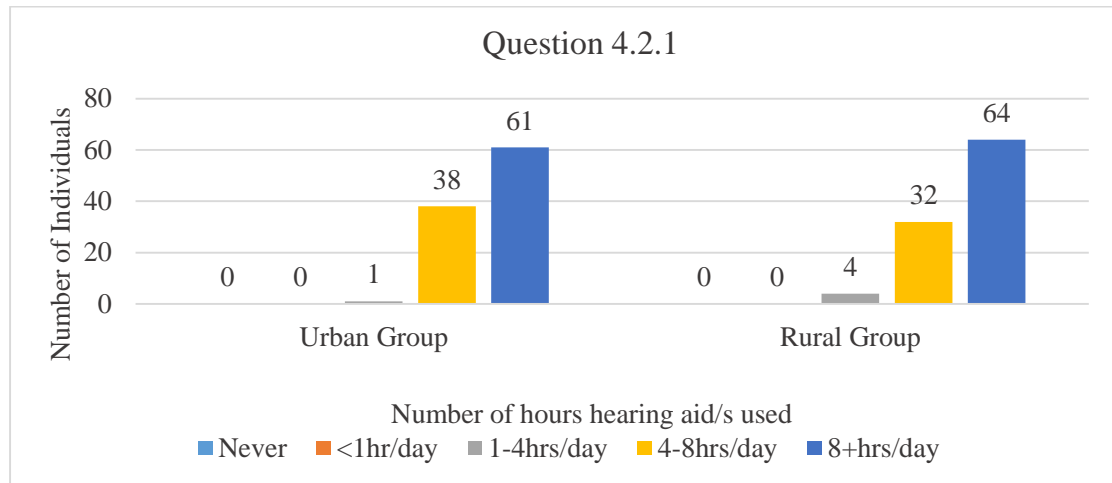


Figure: 4.2.1 Frequency distribution for Question 1 (number of hours hearing aid/s used) in number of individuals

Cox (2003) has reported that the hearing aids usage 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 motivates the user to wear it for longer time. 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. 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 aids. Lupsakko et al (2005) observed that 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 Garstecki and Erler (1998) found that the level of satisfaction was greater among those who are adherent to hearing aid than those who are not adherent to hearing aids.

4.2.2 Question 2

The 2nd question reports about the hearing aid benefit. The findings of the present study indicate (figure 4.2.2) total of 3.0% reported hearing aid/s helped slightly in which 100.0% were urban population. 21.5% of them reported helped moderately among them 69.8% were urban and 30.2% were rural population. 56.0% of them reported helped a quite in that 47.3% were urban and 52.7% were rural population. 19.5% of them reported helped a lot in them 28.2% were urban and 71.8% were rural population. There is a significant difference between the two groups ($p < 0.05$). Rural population was benefited much from hearing aid/s than urban population. This could be due to higher social noise, construction noise and traffic noise in urban areas in comparison to rural, hearing aids perform poorer in lower SNRs. Nonetheless significant differences of all participants 56% of them have reported usefulness as more than or equal to moderately helpful. This indicates that hearing aids have successful in delivering at least 50% of expectations of the users.

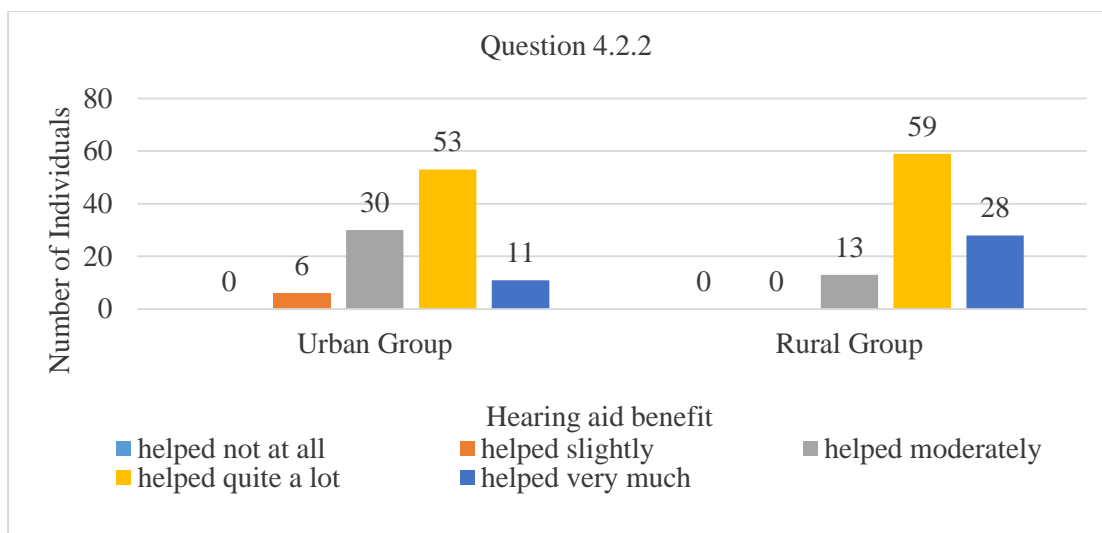


Figure: 4.2.2 Frequency distribution for Question 2 (hearing aid benefit) in number of individuals

Cox, Gilmore, & Alexander (1991) had measured both objective and subjective benefit using shorter and longer term follow-up. Improved objective benefit was seen in results [Connected Sentence Test (CST) (Cox, Alexander, Gilmore, & Pusakulich, 1989)] in addition to the PHAB [Profile of Hearing Aid Benefit (Cox, Gilmore, & Alexander, 1991)]. At 10 weeks post fitting self- perceived benefit was greater than at 2 weeks post-fitting. Similarly in this study also it is shown that more number of participants from both urban and rural settings were getting benefitted from hearing aids.

4.2.3 Question 3

The 3rd question points towards the residual activity limitation (figure 4.2.3). 11.0% reported it's quite a lot of difficulty among which 9.1% were rural and 90.9% were urban population. 27.5% reported moderate difficulty in which 18.2% were rural and 81.8% were urban population. 44.0% reported slight difficulty among them 63.6% were rural and 36.4% were urban population. 17.5% reported no difficulty in that 91.4%

were rural and 17.5% were urban population. There was a significant difference seen between the two groups ($p < 0.05$). Urban group had more residual activity limitation than rural population. Only little literature support is found in this regard. Bentler, Niebuhr, Getta, & Anderson, (1993) have reported that approximately half of the participants reported to get benefit from hearing aid in spite of high cost and expectations. So cost or economic differences between urban and rural population might have not influenced the outcomes. In the study done by Alexander & Beyer, (2003) experienced users reported greater residual activity limitations than novice users. But this experience was not considered as a major variable in this study. These difficulties could have arose due to more unfavourable conditions such as traffic noise, social noise, higher listening and communication demands in the case of urban population which may be due to differences in work place or living areas.

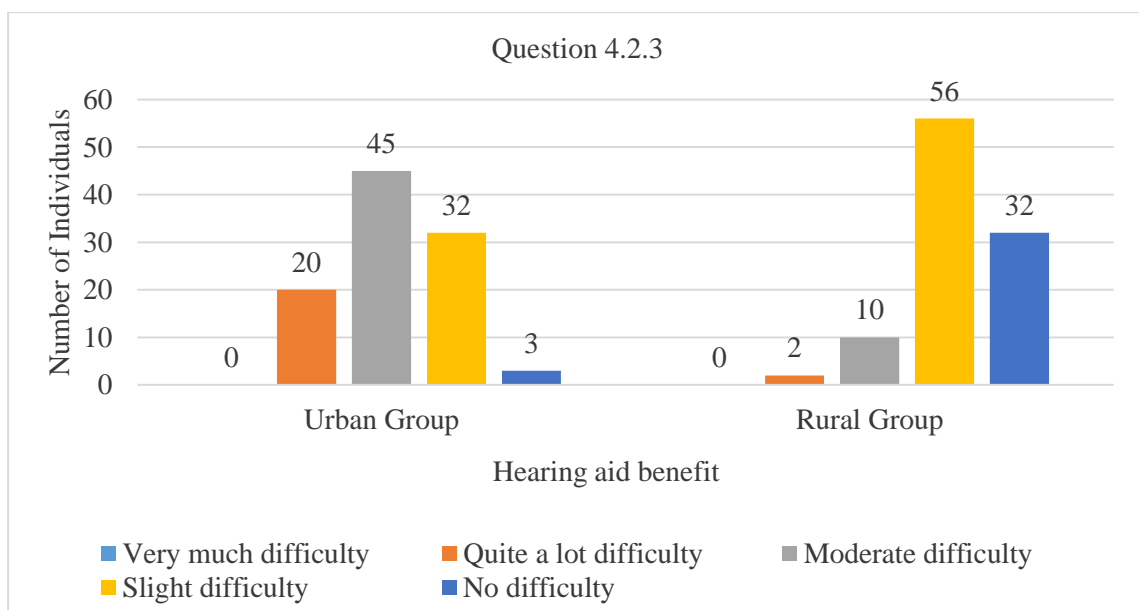


Figure: 4.2.3 Frequency distribution for Question 3 (difficulty with hearing aid) in number of individuals

4.2.4 Question 4

The 4th question describes the satisfaction of the hearing aid user i.e. about how their hearing aid fulfils their expectation (figure 4.2.4). 4.0% reported slightly worth it among which 25.0% were urban and 75.0% were rural population. 55.5% reported moderately worth it in which 53.2% were urban and 46.8% were rural population. 32.5% reported quite a lot worth it among them 44.6% were urban and 55.4% were rural population. 8.0% reported very much worth it in that 62.5% were urban and 37.5% were rural population. There was no significant difference seen between the two groups ($p>0.05$). Though there are no significant differences in satisfaction of hearing aids among urban and rural inhabitants, the number of individuals who rated as quite a lot worth is more in rural group. More number of participants from urban group have rated as very much worth compared to participants of rural group. Number of participants who rated as slightly worth it is also more in rural groups. This might be due to lesser expectations in rural community than that of urban community. It is seen that there is lag in identification of hearing loss and hearing aids fitting this is more in rural population where awareness about hearing aids is lesser and during this interval users formulate expectations from hearing aids, (Weinstein, 1990; Humes et al, 2003; Helvik et al, 2006). Due to lesser demanding lifestyle, simple socio economic activities lesser challenging situations, lesser levels of anxiety and affected confidence levels, less restricted social and personal life, lesser residual activity restrictions among participants of rural group they have slightly higher satisfaction rates than that of urban participants. In this study a slightly higher number of participants from rural group used their hearing aids for more than 8 hours per day than urban participants. This may be also a contributing factor in more number of satisfied users in rural areas. More the duration hearing aids are used more he will be helped in the worst listening situations there by more satisfaction from hearing aids (Cox 2002). Differences in number of

participants among urban and rural group in rating satisfaction level as quite a lot worth and very much worth might have arose due to higher levels of awareness and expectations in urban group. Much of the rural participants have reported more satisfaction than urban, the chances of rural population getting free hearing aids which may be under various schemes of government are higher than urban population which reduces financial burden on them. 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. This might be a contributing factor to higher satisfaction.

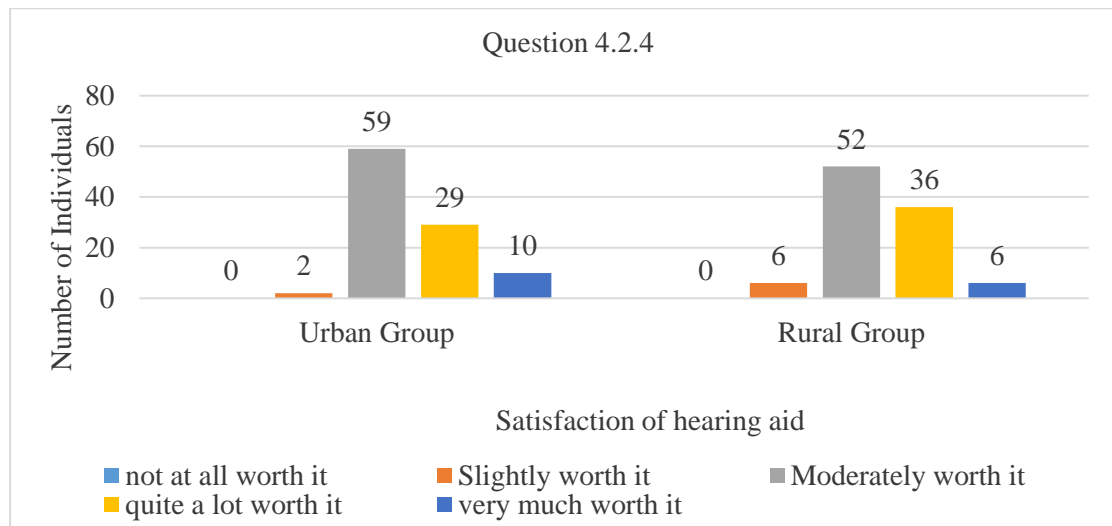


Figure: 4.2.4 Frequency distribution for Question 4 (satisfaction of hearing aid) in number of individuals

4.2.5 Question 5

The 5th question discloses about residual participation (figure 4.2.5). This part of the questionnaire informs about the residual participation restrictions by asking individuals whether their hearing aid affected their daily routine in the last two weeks. 1% reported affected very much of which all were urban population. 5.5% reported affected quite a lot in which 63.6% were urban and 36.4% were rural population.

30.5% reported affected moderately among them 52.5% were urban and 47.5% were rural population. 54.5% reported affected slightly in that 45.9% were urban and 54.1% were rural population. 8.5% reported not at all affected of which 52.9% were urban population and 47.1% were rural population. There was no significant difference seen between the two groups ($p>0.05$). This questionnaire was given to many of the participants when they came for re-evaluation that is when they had problem with their hearing aids that was causing hearing difficulty or when they came for scheduled programming sessions. More than 50% of participants have rated greater than or equal to affected slightly or not affected at all. This explains majority of participants had no residual participation restrictions. Nevertheless of insignificance urban group had slightly more number of participants who rated as affected moderately and a little number of participants rated as affected very much. This could be attributed to higher listening demands and more social noise levels in urban area. Results indicates that more than 50% of participants have reported effect due to hearing loss even after using hearing aids as mild. This infers that hearing aid has delivered at some benefits to user in both groups. Slightly more number of participants from rural group had lower restrictions than of urban group which indicates that residual participation is an important factor for satisfaction in urban group. Rural people tend to compensate this residual participation restriction which is difficult for urban dwellers.

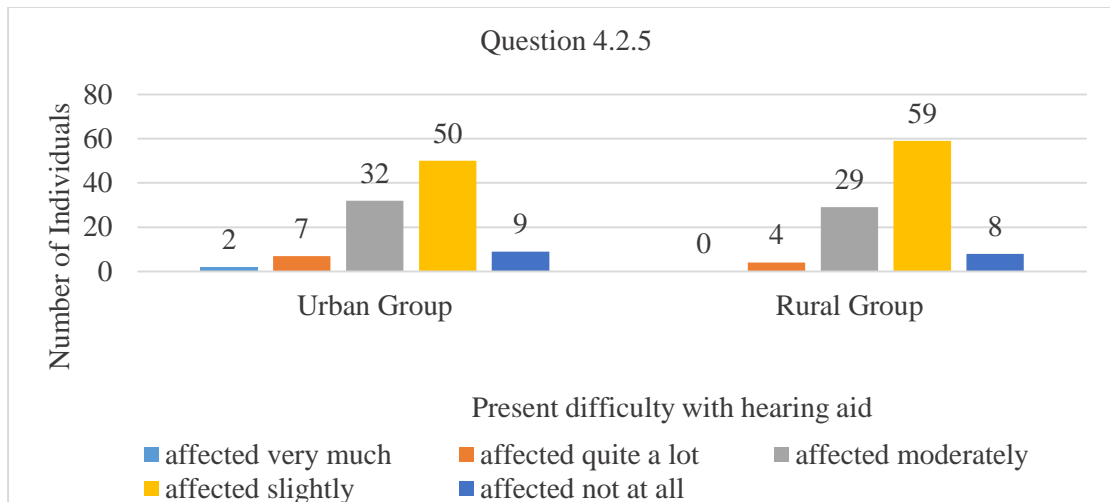


Figure: 4.2.5 Frequency distribution for Question 5 (present difficulty with hearing aid) in number of individuals

4.2.6 Question 6

The 6th question is about the impact of hearing aid use on others (figure 4.2.6). This part of the questionnaire informs about with present hearing aid/s how much the individual thinks other people were bothered by his/her hearing difficulties over past two weeks. 0.5% of all subjects reported bothered very much of this all were from urban group. 7.5% of participants reported bothered quite a lot among which 73.3% were from urban group and 26.7% were rural population. 37.5% reported bothered moderately in which 49.3% were urban and 50.7% were rural population. 48.5% reported bothered slightly among them 46.4% were urban and 53.6% were rural population. 6.0% reported bothered not at all in that 50% were urban and 50% were rural population. There was no significant difference seen between the two groups ($p>0.05$). Despite this insignificance slightly more number of urban participants bothered a lot more than rural population, only urban participants rated as bothered very much and none of the rural participants rated as very much bothered. Often when an individual starts using a hearing aid his or her communication skills increase and the society starts interacting

with them and gives better response to their call which reduces the impact on others after using a hearing aid.

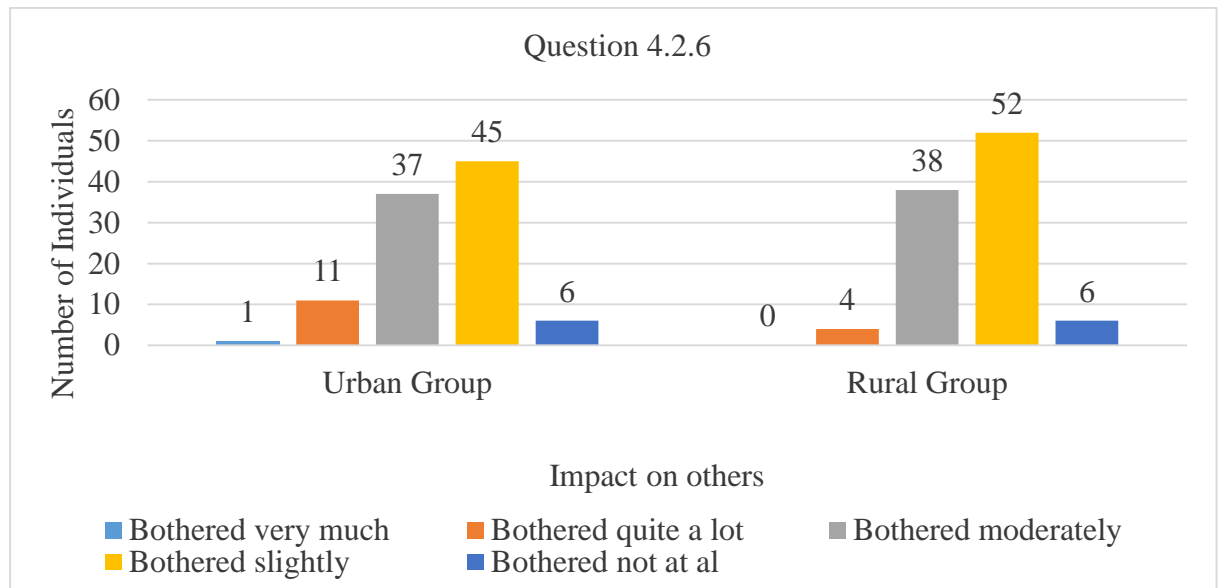


Figure: 4.2.6 Frequency distribution for Question 6 (impact on others) in number of individuals

4.2.7 Question 7

The 7th question is about the quality of life (figure 4.2.7). This part of the questionnaire informs about how much the present hearing aid/s has changed their enjoyment of life. 3% reported no change among which 100% were rural population. 53% reported slightly better in which 42.5% were urban and 57.5% were rural population. 35.5% reported quiet a lot better among them 57.7% were urban and 42.3% were rural population. 8.5% reported very much better in that 82.4% were urban and 17.6% were rural population. It was only rural participants who reported no change in happiness from use of hearing aids. None of the group reported as worse as response. Which means hearing aids have given at least minimum benefits to users. There was a significant difference seen between the two groups ($p < 0.05$). The listening ability of people improves as they start using their hearing aids in all situations which is directly

linked to quality of life from the days when they were not using the hearing aid. More the duration hearing aids are used more he/she will be helped in the worst listening situations there by more satisfaction from hearing aids (Cox 2002). None of the urban participants have reported worsened happiness or no changes in happiness, perhaps urban people have awareness and expectations, which made them to recognize the change that hearing aids have brought. Whereas in rural people have limited awareness and expectations which makes them to fail to recognize the changes brought by hearing aids. In urban population hearing aid/s had changed their enjoyment of life more than in rural population. Tsakiropoulou E et al (2007) mentioned in their study that patient's social and economic status have 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 is the stage at which rural population who have lesser incomes compared to urban counterparts (Ministry of Finance, GoI, 2011-12) faces difficulty. Perhaps due to this reason these people tend to miss out follow up and fine tuning sessions which are critical for better satisfaction and outcomes from hearing aids aid (Saunders GH, Lewis MS, Forsline A). Regular replacements of battery, maintenance and service also involves expenditure where people hailing from rural areas face difficult to bare.

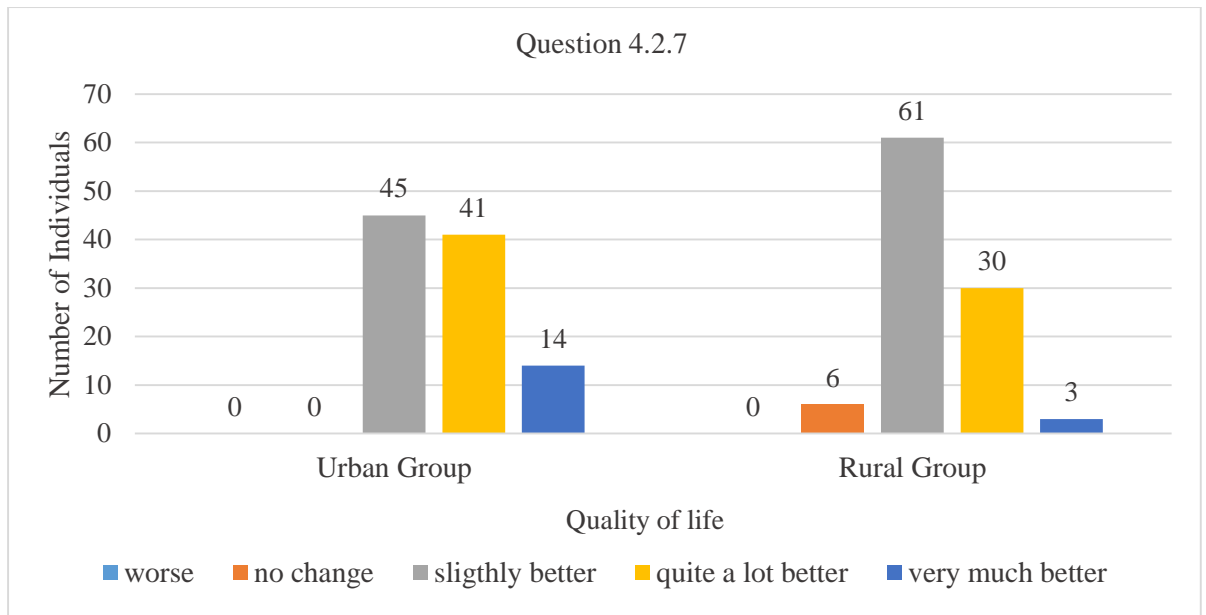


Figure: 4.2.7 Frequency distribution for Question 7 (quality of life) in number of individuals

4.2.8 Question 8

The 8th question is about the hearing difficulty the individual has when not wearing a hearing aid (figure 4.2.8). 15% of study population reported very difficult in absence of hearing aids of which 53.3% were from urban group and 46.7% were from rural group. 31.0% reported moderately severe difficulty among which 53.2% were urban and 46.8% were rural population. 46.5% reported moderate difficulty in which 49.5% were urban and 50.5% were rural population. 6% reported mild difficulty among them 25% were urban and 75% were rural population. Only 1.5% reported none in that 33.3% were urban and 66.7% were rural population. There was no significant association of society with perceived difficulty in the absence of hearing aids ($p > 0.05$). These variations could have arose due to differences in degree of hearing loss among all individuals in the study. Absence of hearing aid brought more of moderate level difficulties in rural population whereas more of moderately severe level difficulties in

the urban group. Hearing impairment has equally affected the participants irrespective of their living areas which infers that hearing impairment affects all population more or less equally but in different domains.

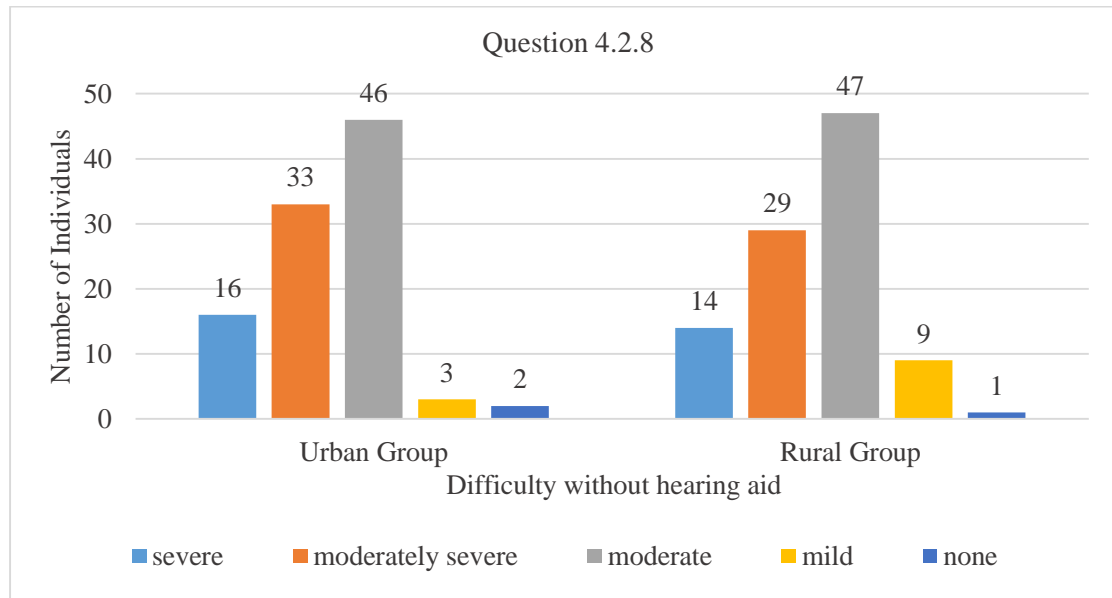


Figure: 4.2.8 Frequency distribution for Question 8 (difficulty without hearing aid) in number of individuals.

iii. Differences in self-assessment of communication with use of hearing aids

4.3.1 Question 1

This question is about the communication difficulties experienced with use of hearing aids in situations with one other person (figure 4.3.1) ex. At home, work, in a social situation, with a waitress, with spouse, boss etc. even while using hearing aid/s. 27.5% of all reported as almost never among which 18.2% were urban and 81.8% were rural population. 47.5% of all reported as occasionally among that 65.3% were urban and 34.7% were rural population. 18.0% of all reported as about ½ of the time among that 55.6% were urban and 44.4% were rural population. 6% reported as frequent (about ¾ of the time) in that 58.3% were urban and 41.7% were rural population. 1.0% of all

reported as practically always (or always) in that both rural & urban population had 50%. There is a significant difference between two groups ($p < 0.05$). Results showed that urban population had more difficulties than rural population. The difference existing can be due to differences in lifestyle and social activities in urban settings. E.g. urban dwellers are prone to communicate with their office mates, boss or seniors, they have more social interaction such as banking, post office, busy market places and hotels. These presence of interfering ambient noise and multi talker conditions are not uncommon in these situations making listening process more challenging.

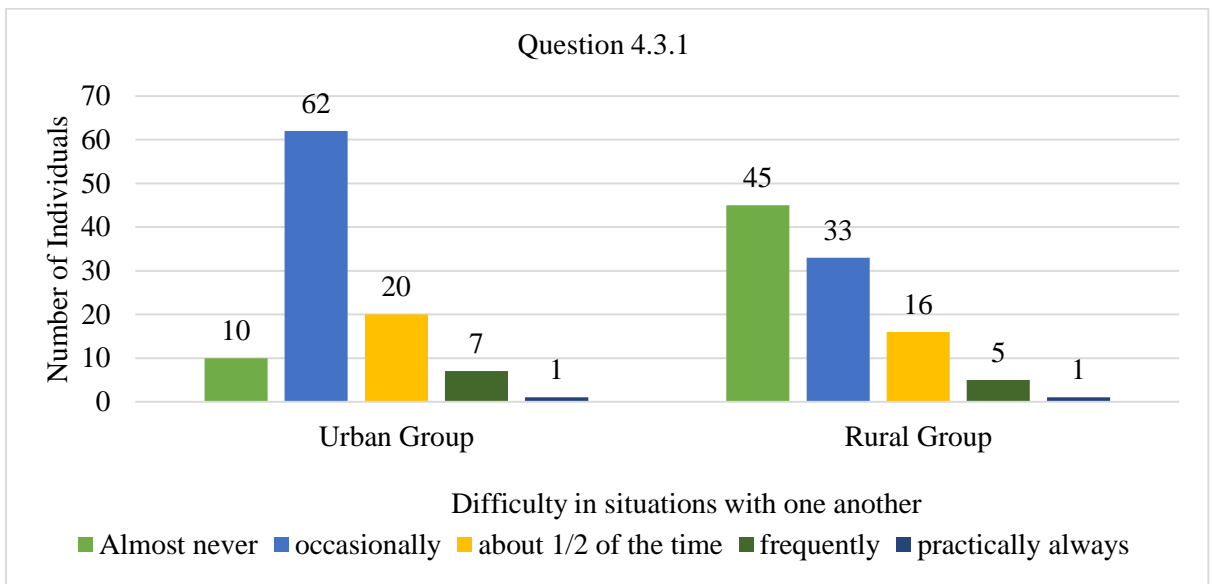


Figure: 4.3.1 Frequency distribution for Question 1 (difficulty in situations with one another) in number of individuals

4.3.2 Question 2

This question is about the communication difficulties experienced while watching TV and in various types of entertainment ex. movies, radio, plays, night clubs, musical entertainment, etc. with hearing aid/s (figure 4.3.2). 26% reported as almost never among which 44.2% were urban and 55.8% were rural population. 59.5%

participants reported occasionally of them 51.3% were from urban group and 48.7% from rural group. 11.5% reported as about 50 percent of the time among those 56.5% were urban and 43.5% were rural population. 2.5% reported as frequent (about 75 percent of the time) in that 33.3% were urban and 66.7% were rural population. 0.5% of them reported as practically always (or always) in that 100% were urban population. There is a no significant difference between two groups ($p>0.05$). Results showed that urban population had less difficulties than rural population in communication difficulties while watching TV and in various types of entertainment. Nevertheless insignificance of results points that urban population had slightly more problems than rural group which could be due to differences in social activities in urban society such as visiting night clubs, drama show which are little in rural areas.

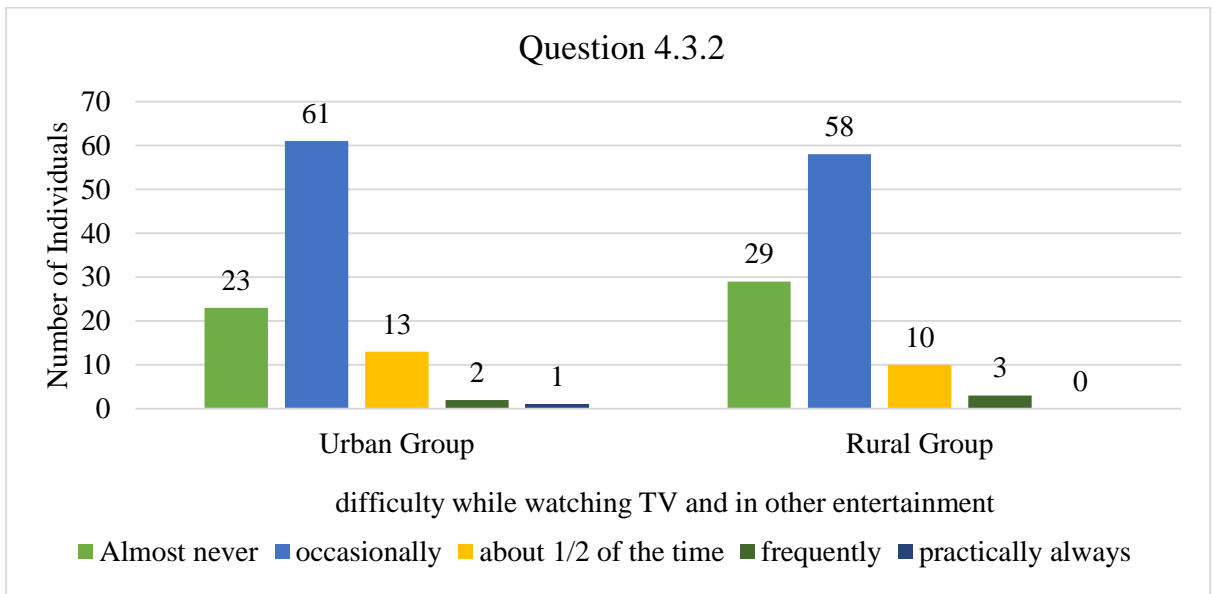


Figure: 4.3.2 Frequency distribution for Question 2 (difficulty while watching TV and in other entertainment) in number of individuals

4.3.3 Question 3

This question is about the communication difficulties experienced in situations when conversing with a small group of several persons ex: with friends, co-workers, in meetings or casual conversations, over dinner or while playing cards, etc. with hearing aid/s (figure 4.3.3). 6.5% reported as almost never among which 23.1% were urban and 76.9% were rural population. 33% reported as occasionally among that 54.5% were urban and 44.5% were rural population. 53.5% of all reported as about ½ of the time among that 47.7% were urban and 52.3% were rural population. 7.0% reported as frequent (about ¾ of the time) in that 71.4% were urban and 28.6% were rural population. None of the group reported as practically always (or always). There is no significant difference between two groups ($p>0.05$). Results showed that though there is no significant association between groups and slightly more number of urban participants have come across more difficulties than rural participants in communicating in situations like conversing with a small group of several persons. Neither of the groups have faced difficulties practically always. Challenging situations like chatting with many friends, family, playing in groups and meetings where there are multiple speakers makes listening difficult irrespective of urban or rural settings. It was seen that socio economic conditions did not contribute to benefits and outcomes of hearing aids (Jerram and Purdy, 2001).

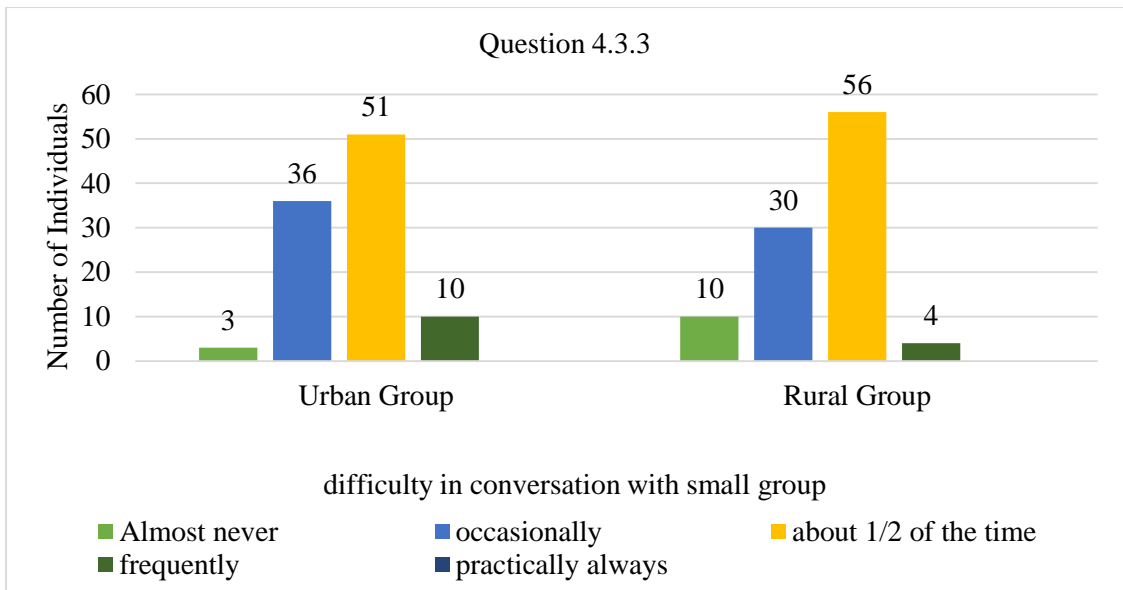


Figure: 4.3.3 Frequency distribution for Question 3 (difficulty in conversation with small group) in number of individual

4.3.4 Question 4

This question is about the communication difficulties experienced when he/she is in an unfavorable listening environment ex: at a noisy party, where there is background music, when riding in an auto or bus, when someone whispers or talks from across the room, etc. with hearing aids (figure 4.3.4). 8.5% reported as almost never among which 41.2% were urban and 58.8% were rural population. 40% reported as occasionally among that 51.3% were urban and 48.8% were rural population. 48.5% reported as about ½ of the time among that 50.5% were urban and 49.5% were rural population. 3% reported as frequent (about ¾ of the time) in that 50% were urban and 50% were rural population. None of the groups reported as practically always (or always). There is no significant difference between two groups ($p > 0.05$). Results showed that despite insignificant association of urban or rural areas with difficulties faced urban population had slightly more difficulties than rural population in communicating in situations like conversing with a small group of several persons.

There's small difference among who reported almost never difficulties, rural participants have reported it more than urban participants. Situations such as listening in auto, bus background music, hearing to whispers and distant calls taxes on ease of listening irrespective of demographic factors.

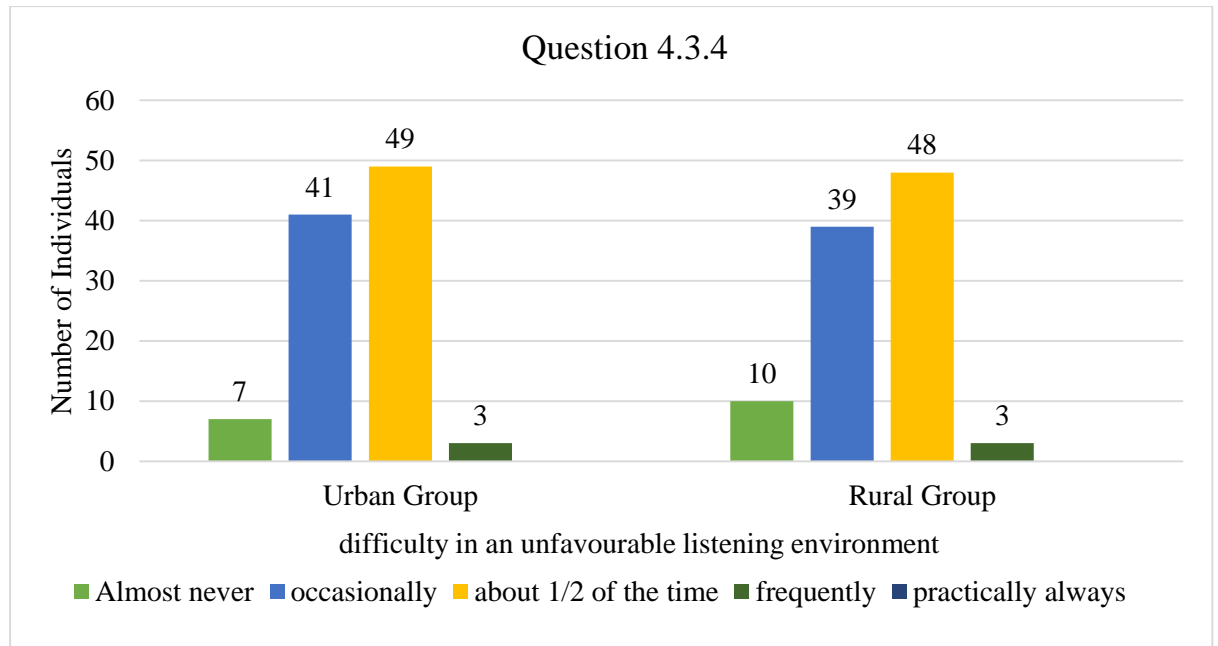


Figure: 4.3.4 Frequency distribution for Question 4 (difficulty in an unfavorable listening environment) in number of individuals

4.3.5 Question 5

This question is about how often he/she experience communication difficulties in the situation where he/she most wants to hear better with hearing aids (figure 4.3.5). 19.0% of all reported as almost never among which 2.6% were urban and 97.4% were rural population. 44.5% reported as occasionally among that 37.1% were urban and 62.9% were rural population. 25.0% reported as about 1/2 of the time among that 88.0% were urban and 12.0% were rural population. 9.5% reported as frequent (about 3/4 of the time) in that 94.7% were urban and 5.3% were rural population. 2.0% reported as practically always (or always) in that 100% were urban population. There is a

significant difference between two groups ($p < 0.05$). Results showed that urban population faced more difficulties than rural population in the situation where he/she most wants to hear better even with using hearing aid/s. This may be due to noisy workplace, multiple talkers around, increased demands of listening which are pretty common in urban settings.

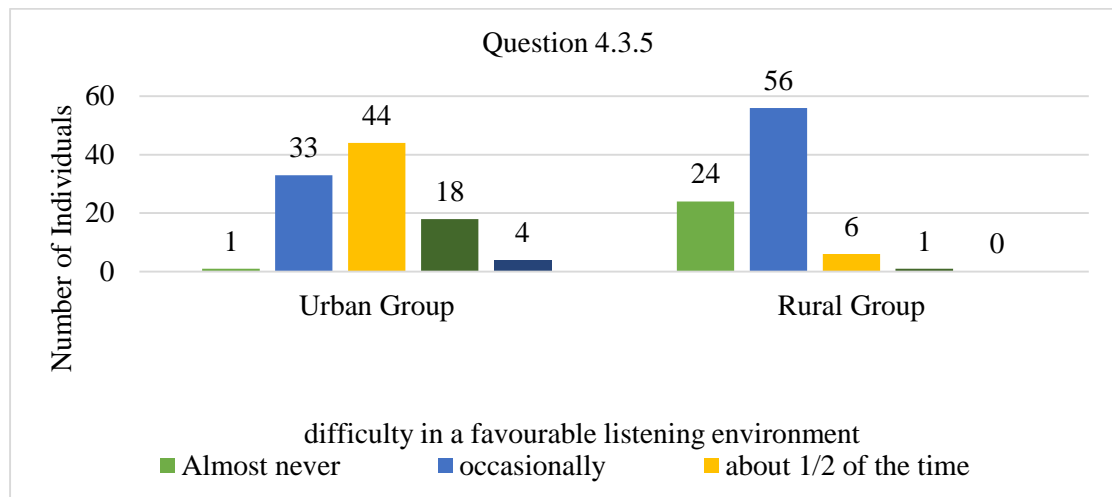


Figure: 4.3.5 Frequency distribution for Question 5 (difficulty in an unfavorable listening environment) in number of individuals

4.3.6 Question 6

This question is about difficulty experienced in hearing soft, medium, and loud environment sounds appropriately ex: telephone ring, doorbell ring, traffic, horns, alarms etc. with hearing aids (figure 4.3.6). 49.5% of them reported as almost never among which 47.5% were urban and 52.5% were rural population. 40% of them reported as occasionally among that 51.3% were urban and 48.7% were rural population. 8% of them reported as about 1/2 in that 43.8% were urban and 56.2% were rural participants. 2.5% reported to have difficulty frequently 3/4 of times. Neither of groups reported practically always difficulty. There is no significant difference between two groups ($p > 0.05$). More than 80% of all participants experienced no more than occasional

difficulties in hearing soft, medium, and loud environment sounds appropriately with hearing aid/s, all of them were able to listen to calling bells, traffic noise, alarms or horns and phone rings. Results are as expected because these sounds are pretty loud enough to make their path through hearing aids unlike whispers or other soft sounds such as distant calls. All hearing aids have this minimum capacity of capturing these sounds and processing them. Only a little reported more than occasional difficulties which can be due to individual or situational variations.

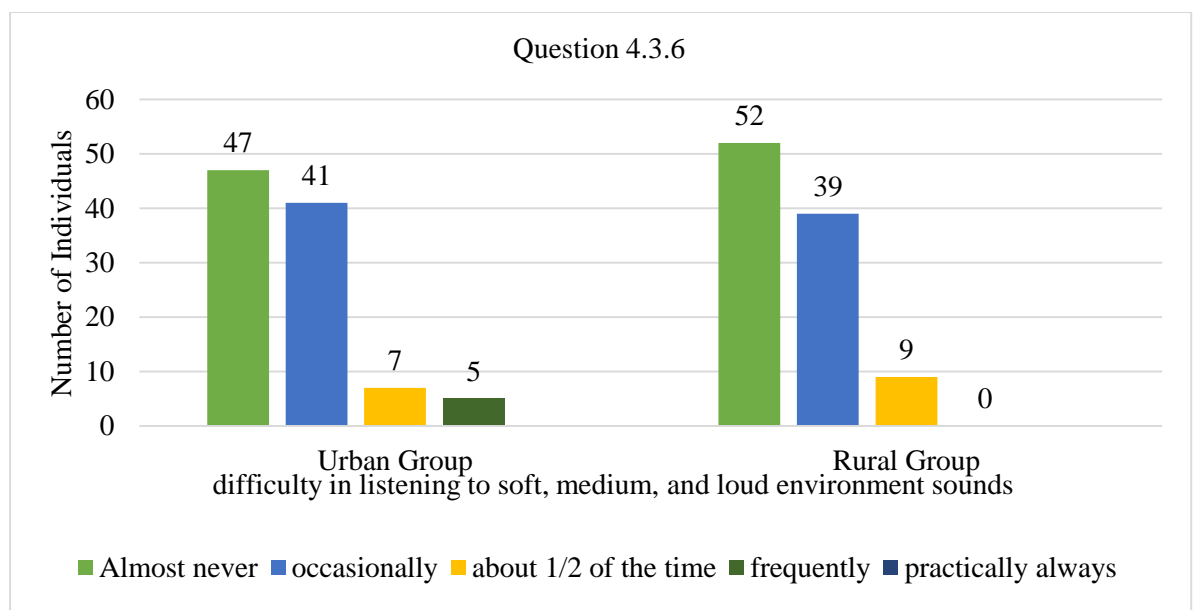


Figure: 4.3.6 Frequency distribution for Question 6 (difficulty in hearing soft, medium, and loud environment sounds) in number of individuals

4.3.7 Question 7

This question is about if difficulty with hearing, negatively affects or hampers his/her personal or social life with hearing aids (figure 4.3.7). 24.0% of them reported as almost never among which 72.9% were rural and 27.1% were urban population. 51.5% of them reported as occasionally among that 52.4% were rural and 47.6% were urban population. 20.5% of them reported as about 1/2 of the time among that 19.5% were rural and 80.5% were urban population. 14.0% of them reported as frequently among that 14.0% were rural and 0% were urban population. 0% of them reported as practically always among that 0% were rural and 0% were urban population.

were rural and 80.5% were urban population. 4.0% reported as frequent (about $\frac{3}{4}$ of the time) in that 37.5% were rural and 62.5% were urban population. Either of the group reported as practically always (or always). There is a significant difference between two groups ($p < 0.05$). Results showed that hearing impairment had negatively affected or hampered his/her personal or social life appropriately even with using hearing aid/s in urban population more than that of rural population. Perhaps the differences in living style, environment and socio economic activities of rural and urban societies have made less restriction participant's daily activities. People living in rural settings mainly involve in agriculture and other minor economic activities (SECC, Ministry of Rural Development Govt. of India, 2011) which does not induce difficult hearing situation and individual can easily carry out his/her activities such as farming, household works and small noisiness such as shops etc. Individuals hailing from urban areas especially females are more conscious about their body image though they are in slums (Dixit, S et al, 2011), wearing hearing aids in social life is a matter of apprehension. Also it feels embarrassed to accept publically that the person has hearing impairment and uses hearing aids. Perhaps these factors have made urban dwellers to keep themselves more away from social gatherings compared to rural participants. Rural participants are no less in restricting themselves from social gatherings of all those who rated as sometimes 53.2% are from rural setting. Females from rural areas are also equally concerned about their body image (Hutchison, J. A), wearing hearing aids is not cosmetically acceptable. This may be one of reasons why people avoid social life. Hearing impairment causes reduction in self-esteem, self-confidence and the way how impaired person feels towards himself and brings many negative outcomes (Chen, 1994; Dugan & Kivett, 1994).

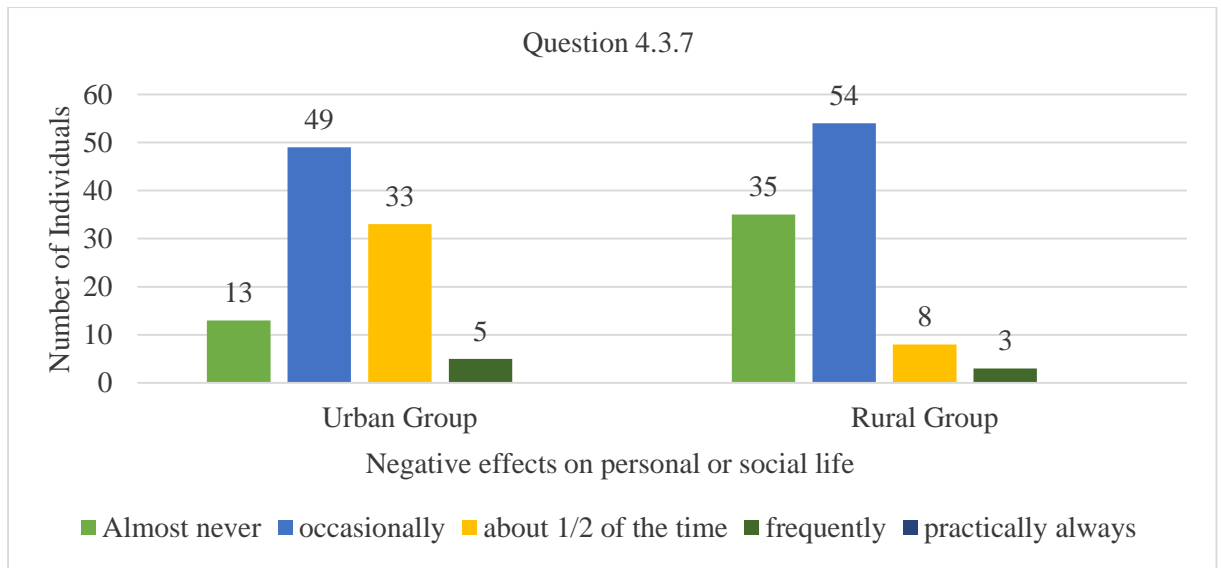


Figure: 4.3.7 Frequency distribution for Question 7 (difficulty in hearing soft, medium, and loud environment sounds) in number of individuals

4.3.8 Question 8

This question is about if individual feels that any problem or difficulty with hearing worries, annoys or upsets him/her with hearing aids (figure 4.3.8). 12.0% of them reported as almost never among which 25.0% were urban and 75.0% were rural population. 36.0% of them reported as occasionally among that 34.7% were urban and 65.3% were rural population. 45.0% of them reported as about ½ of the time among that 66.7% were urban and 33.3% were rural population. 5.0% reported as frequent (about ¾ of the time) in that 50.0% were urban and rural population each. 2.0% reported as practically always (or always) among which 100% were urban population. There is a significant difference between two groups ($p < 0.05$). Results showed urban population felt more problem or difficulty with hearing worries, annoys or upsets him/her even with using hearing aid/s than rural population. This could be due to problems such as restricted personal and social activities, difficulty in listening in noisy situations, difficulties in communication in willing to listening conditions, difficulties in enjoying

social life and difficulties in listening to group conversations or multiple speakers etc. (which are uncommon in rural settings) as seen in above section. There are also underlying differences in of life in rural and urban population due to the difference in the socio-demographic factors, social resource, lifestyle behaviours and income adequacy (Mudey A. et al, 2011)

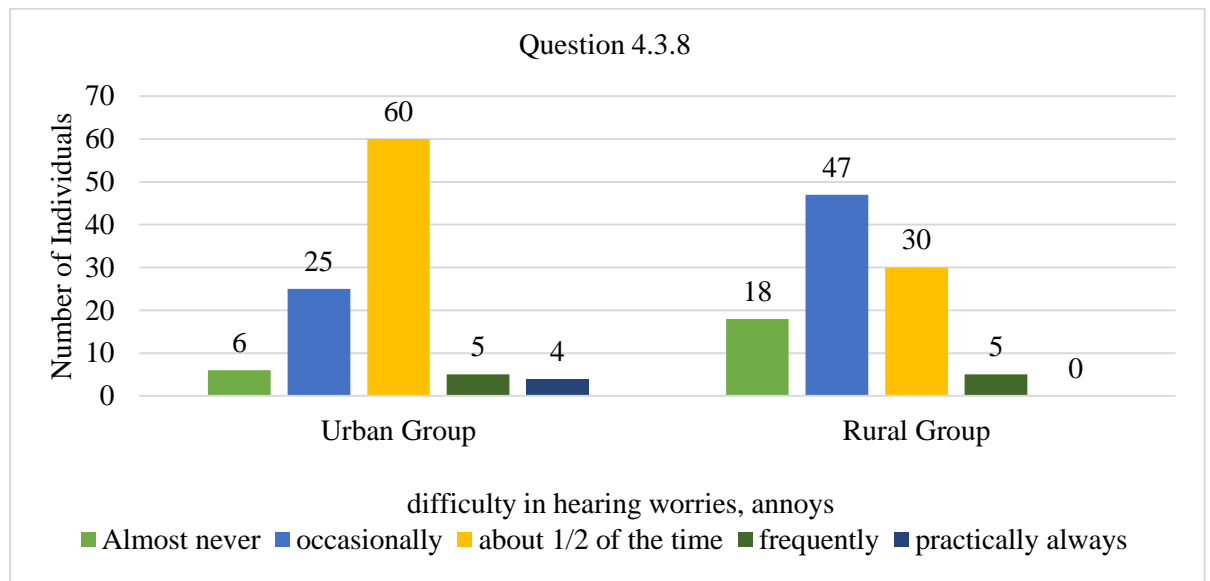


Figure: 4.3.8 Frequency distribution for Question 8 (difficulty in hearing worries, annoyances) in number of individuals

4.3.9 Question 9

This question is if the individual or others seem to be concerned or supported to hearing aid users (figure 4.3.9). 9.5% of them reported as occasionally among which 5.3% were urban rural population. 23.5% of them reported as about half of the times among that 36.2% were urban and 63.8% were rural population. 44.0% of them reported as frequently among that 53.4% were urban and 46.6% were rural population. 23.0% reported as practically always in that 76.1% were urban and 23.9% were rural population. There is a significant difference between two groups ($p < 0.05$). Results showed rural population were more concerned or annoyed that he/she has a hearing

problem even with using hearing aid/s than rural population. Urban population had more support and concern from others than the rural populations. Hearing impairment causes more functional and emotional disturbances among people of urban settings than of rural settings which can affect their personal and social life, residual activity restrictions were more among urban group factors like these bring multiple negative effects in patient making him mentally and physically less functioning (Jerger, Chmiel, Wilson, & Luchi, 1995) that bothers his family or peer group, to avoid these situations other might show more concern to hearing aid users. Levels of awareness, education, and access to health care are more in urban population, this makes family members to understand more aspects of hearing loss and hearing aids usage. In rural scenario awareness and educational levels, quality of life and economic levels are lower than that of urban settings (Islam, M, 2014). Lack of education and awareness among family members might have made them to know less about hearing loss and hearing aids which made rural population to get less concern and support from others and common belief among rural people is hearing impairment of is indicator of ageing and frailty (Stark, P., & Hickson, L. 2004). They tend to accept this as course of nature and do not worry much. Higher levels of myth and misconceptions regarding hearing loss is more in rural areas (Manjunath Y N, 2014) could have also contributed to these differences.

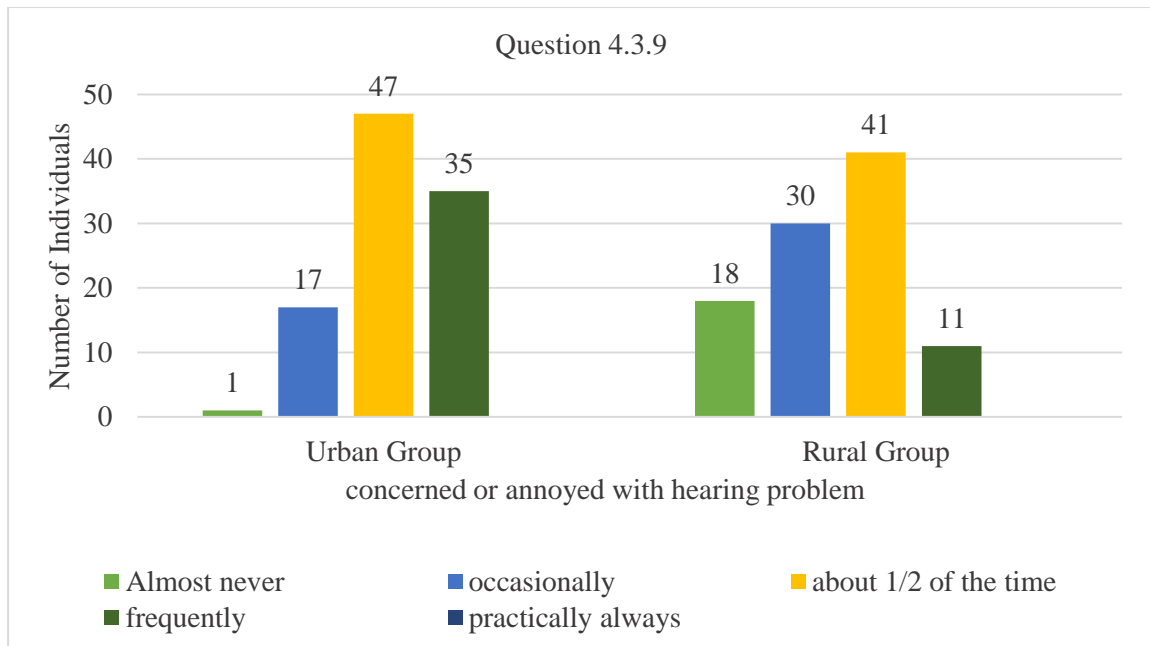


Figure: 4.3.9 Frequency distribution for Question 9 (concerned or annoyed with hearing problem) in number of individuals

4.3.10 Question 10

This question is about how often does hearing loss negatively affect his/her enjoyment of life with hearing aids (figure 4.3.10). 9.5% of them reported as almost never among whom 26.3% were urban and 73.7% were rural population. 33.5% of them reported as occasionally among that 28.4% were urban and 71.5% were rural population. 41.5% of them reported as about ½ of the time among that 61.4% were urban and 38.6% were rural population. 12% reported as frequent (about ¾ of the time) in that 75% were urban and 25% were rural population. 3.5% of participants reported as practically always (or always) of them all were from urban group. None of rural participants reported practically always. There is a significant difference between two groups ($p < 0.05$). Results indicate of happiness of urban population being more negatively affected. Number of participants who reported effects as more than half of the times were more among urban group whereas in rural group more participants have

reported effects to be occasionally or rarely. As discussed in previous sections concern for beauty or body image is more among urban population (Dixit, S et al, 2011), which they think might get affected by wearing hearing aids due to its unappealing cosmetics. Lifestyle and cultural differences in urban settings, challenging listening situations perhaps which are more commonly encountered in urban settings. Reduced self-esteem and diminished functional status due to hearing impairment (Chen, 1994), confidence levels were more affected among urban population than rural as indicated by results of this study. Wearing hearing aids might be a cause for feeling embarrassed as more of urban people felt embarrassed as we saw in previous sections. More number of urban participants reported that they avoid social gatherings or parties. Levels of happiness is more among rural participants than that of those living in large central cities (Berry B. J, 2011). These factors along with higher pre-existing happiness in rural areas could have made rural population to be less affected on their happiness of life.

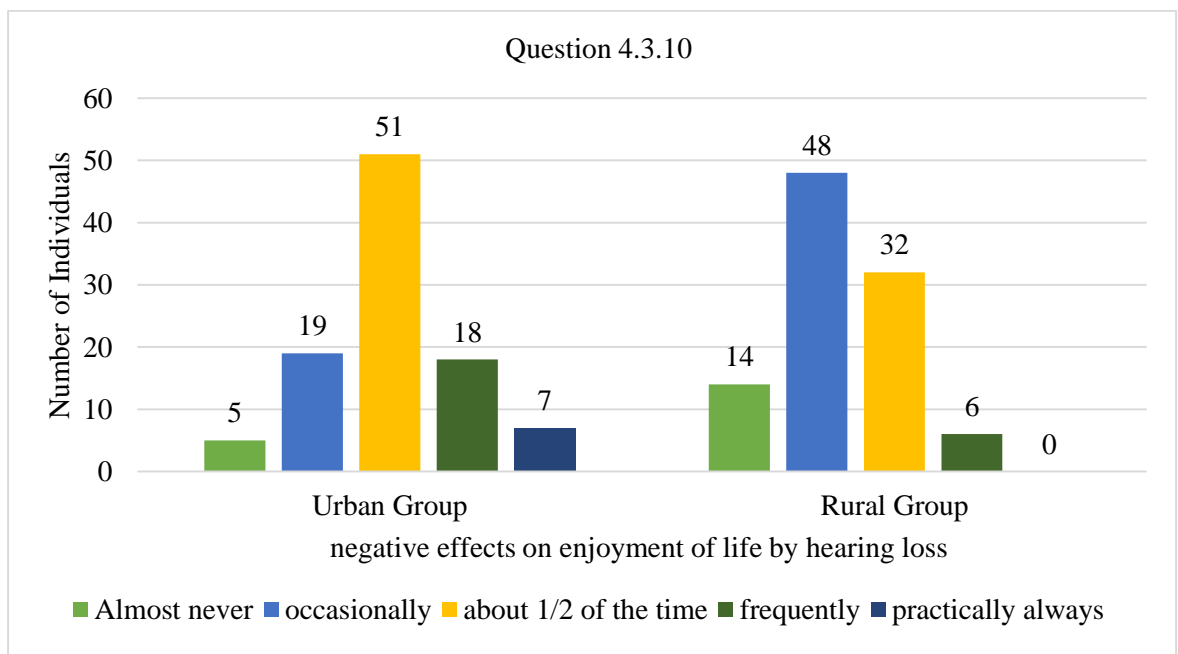


Figure: 4.3.10 Frequency distribution for Question 10 (negative affect on enjoyment by hearing loss) in number of individuals

4.3.11 Question 11

This question is about on an average, number of hours the hearing aid was used in a day. The findings of the present study indicate (figure 4.3.11) total of 2.5% used hearing aid/s for 1 to 4 hours a day in which 20.0% were urban and 80.0% were rural population. 35.0% used hearing aid/s for 4 to 8 hours a day among them 54.3% were urban and 45.7% were rural population. 62.5% used hearing aid/s for more than 8 hours per day in that 48.8% were urban and 51.2% were rural population. There is no significant difference between the two groups on the number of hours hearing aid/s is used ($p>0.05$).

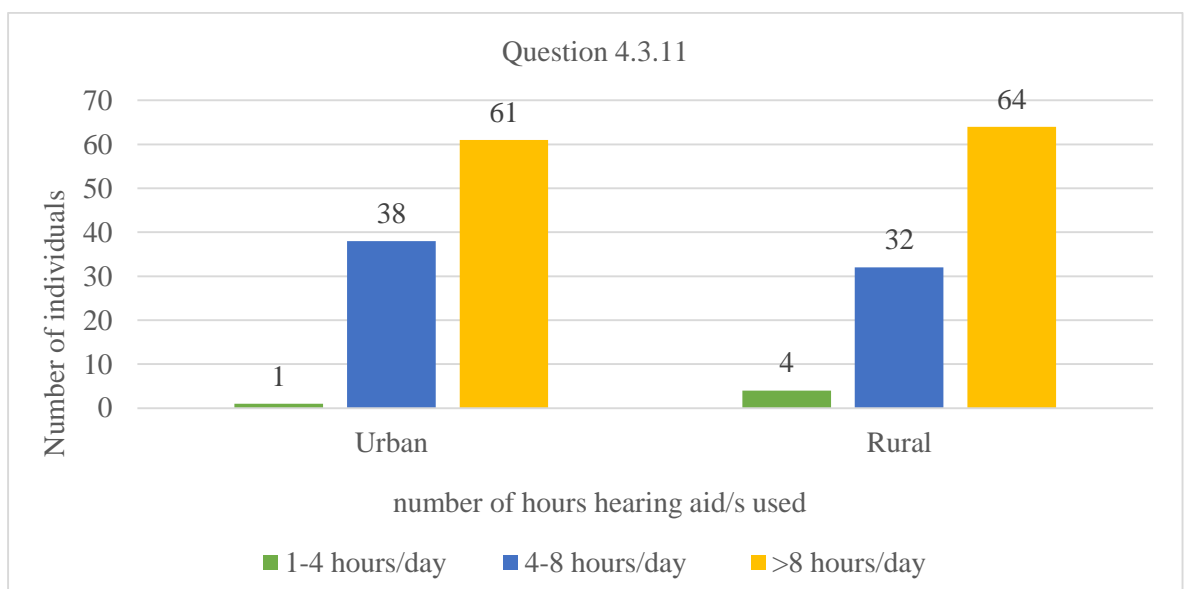


Figure: 4.3.11 Frequency distribution for Question 11 (number of hours hearing aid/s used) in number of individuals

The listening ability of people improves as they start using their hearing aid in all situations which is directly linked to higher satisfaction and outcomes from hearing aids from day one. More the duration hearing aids are used more he/she will be helped in the worst listening situations thereby more satisfaction from hearing aids (Cox 2002).

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.

4.3.12 Question 12

Last question describes the overall satisfaction of the hearing aids by user i.e. about how their hearing aid fulfils their expectation (figure 4.3.12). 4.0% reported slightly satisfied among which 25.0% were urban and 75.0% were rural population. 55.5% reported moderately satisfied in which 53.2% were urban and 46.8% were rural population. 32.5% reported mostly satisfied among them 44.6% were urban and 55.4% were rural population. 8.0% reported very much satisfied in that 62.5% were urban and 37.5% were rural population. There was no significant difference seen between the two groups ($p>0.05$).

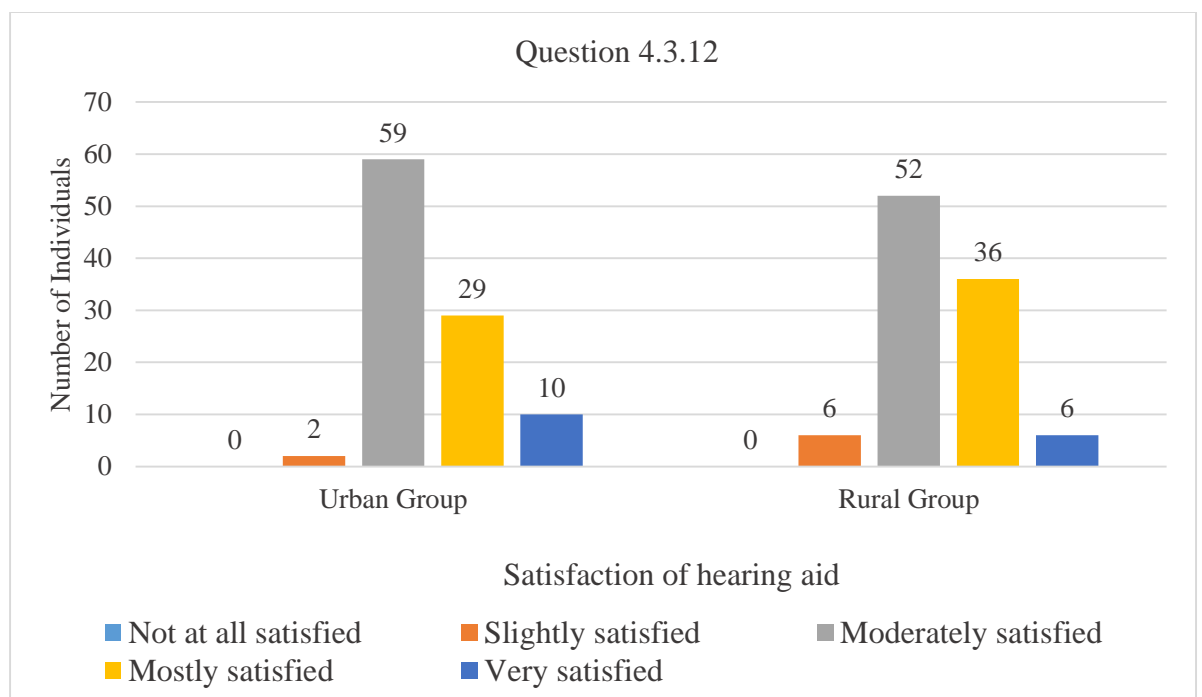


Figure: 4.3.12 Frequency distribution for Question 12 (negative affect on enjoyment by hearing loss) in number of individuals

Despite insignificance higher number of rural population have reported to be moderately satisfied, a little participants from urban group have reported very satisfied which could not be seen in rural group which could be due to higher end hearing aids which are costly and difficult for rural population to take up them. Higher end hearing aids have multiple channels, better noise reduction algorithms, adaptive/ multiple microphones, efficient feedback reduction strategies and other connectivity options which helps to deliver high fidelity sounds. Anxiety, affected confidence levels, residual activity restrictions, demanding listening situations, restricted personal and social activities, embarrassment or stress, nervousness and being uncomfortable were found to be lesser in rural areas in shown by the results in this study. Levels of happiness is more among rural participants than that of those living in large central cities (Berry B. J, 2011). These factors along with pre-existing happiness, nature of socio economic activities, lifestyle might have contributed to more satisfaction among rural participants. Slightly more number of rural participants reported that they use hearing aids more than 8 hours per day than that of urban groups. More the duration hearing aids are used more he/she will be helped in the worst listening situations there by more satisfaction from hearing aids (Cox 2002).

Chapter 5

SUMMARY AND CONCLUSIONS

The estimated prevalence of adult onset hearing loss in India was found to be 7.6% (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. Loss in urban and rural areas were 9% and 10% respectively. Number of persons with hearing disability per 100,000 was found to be 291: it was found to be higher in rural areas (310) in comparison with urban areas (236).

Present study was carried out to observe differences in handicap faced, challenging situations and outcomes of the hearing aids across rural and urban population. Hence the main purpose of study was to find out how differently handicap has affected the rural and urban population, how different are the challenges in listening situations in them and how differently hearing aids have brought outcomes across these populations. The participants of the study included 200 adult subjects with hearing loss of mild to severe hearing loss in the range of 18 to 59 years who were subdivided in to two groups based on their area of living a urban (100) and rural (100) groups. Participants who were using the hearing aid at least for a period of minimum 3 months were selected for the study.

Hearing Handicap Questionnaire (HHQ), International Outcome Inventory – Hearing Aids (IOI-HA) and Patients Self-Assessment of Communication (SAC) were administered on these subjects and responses were recorded. Obtained results were subjected to statistical analysis using IBM's Statistical Package for Social Studies (version 23). Chi-square test was administered to find out association between each

item and experimental groups (rural area v/s urban area). Analyzed results are summarized below;

1. Urban groups were more aware about their hearing difficulties than rural group and urban group faced more uncomfortable and nervousness than rural groups.
2. Affected levels of individual's confidence were more among urban population than rural population.
3. People living in urban setting were more worried and anxious due to hearing difficulties than people living in rural settings.
4. The participants from urban group experienced embarrassment significantly more than participants from rural group.
5. People with hearing difficulties rarely faced tiredness or stress irrespective of urban or rural groups.
6. Participants from urban group faced more restrictions in their works or things they do. Rural population faced lesser restrictions.
7. Urban population were more felt inconvenience more often than rural population. Participants from urban group avoided social situations more than rural group participants.
8. Hearing difficulties has imposed more restrictions in personal or social life of urban population than in personal or social life of rural population. Urban participants felt that they were more cut off from things they do than rural population due to their hearing difficulties.
9. Both urban and rural groups used their hearing aids more than 4hours per day with majority using 8 hours per day.

10. Hearing aids have more helped rural group than urban group. Hearing aids were successful in helping majority of participants at least quite lot times.
11. Residual activity limitation was more found in urban population than rural population.
12. There was higher rates of satisfaction among rural groups than urban group but was not significant. Hearing aids have moderately fulfilled expectations majority of participants.
13. Residual participation restriction was insignificantly higher among urban participants.
14. After use of hearing aids hearing difficulties in participants made others to bother less among majority of participants in both urban and rural groups.
15. Use of hearing aids have brought significantly higher improvement in quality of life and brought more joy in life among urban population than rural population.
16. Both urban and rural population experienced moderate to severe levels of difficulties in the absence of hearing aids. These difficulties were insignificantly higher among urban dwellers.
17. Difficulties faced by urban population were more occasional than rural populations in situations like social gatherings, market places, offices and colleagues and entertainment programs.
18. Both groups faced difficulties about half of the times in communication situations like crowds, parties with high levels of background music, commuting in public transport and listening to whispers.

19. Majority of participants irrespective of urban or rural groups had faced less difficulties in hearing to environmental sounds such as calling bell, phone rings, traffic noise and alarms etc.
20. Hearing difficulties have negatively affected individuals personal and social life in more proportions of urban population than rural populations.
21. Hearing difficulties have caused more annoyance to urban participants than rural participants.
22. Others have supported or shown concern to hearing impaired more frequently among urban group than rural group. Urban group has higher family or peer group support.
23. Hearing aids have moderately satisfied all participants irrespective of the experimental groups. There's a little higher rates of satisfaction among rural population.

In a nut shell urban population had more perceived handicap and more difficulty in challenging listening situations than rural population. Challenges in listening situations vary across type of areas where the subjects are hailing from. Outcomes measure of hearing aids shown that majority had moderate level of satisfaction from their hearing aids with slightly more number of rural participants having higher rates of satisfaction. Among those who were very satisfied urban population had upper hand.

Implications of study

1. The study will be helpful in supporting need of customized hearing aid fitting procedures.
2. 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.
3. Helps us to understand setting programmes differently for people based in their social strata (urban or rural).
4. Results of this study can be useful for the clinician/ audiological practitioner to understand the problems and needs of hearing aid users and provides guidelines to counsel and determine the benefits from hearing aids.
5. The study will also give some insight about relationship between hearing aid use, listening situations and social strata (urban and rural) which can assist the professional to plan more efficient aural rehabilitation plans.

Limitations of the study;

The major limitations of the study was small population sample of only 200 participants.

There were only handful of literature to support this study.

Future research:

Other factors which influence the outcomes such as type of hearing aid, technologies used in hearing aids and the contribution of speech spectrum of the language to hearing aid use can be studied.

Similar study could be carried out among different kind of work places or professions to observe differences or changes. This would help audiologists to fine tune the hearing aids more efficiently.

Nowadays cochlear implants are getting popularity which may be due to social security policies and awareness. Hence this study can be carried out in cochlear implants recipients to measure differences among urban and rural population which might be helpful in planning appropriate aural rehabilitation program.

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APPENDIX 1

ಶ್ರವಣ ಪ್ರತಿಬಂಧಕಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಪ್ರಶ್ನೆಗಳಿ					
	ಯಾವಾಗಲೂ ಇಲ್ಲ	ಅಪರೂಪಕ್ಕೆ	ಕೆಲವು ಬಾರಿ	ಹಲವು ಬಾರಿ	ಹೆಚ್ಚು ಕಡಿಮೆ ಯಾವಾಗಲೂ
1. ನಿಮಗೆ ಕೇಳುವಿಕೆಯ ತೊಂದರೆ ಇದೇ ಎಂದು ನೀವು ಎಷ್ಟು ಬಾರಿ ಜಾಗೃತರಾಗಿದ್ದೀರಾ?					
2. ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದಾಗಿ ನಿಮಗೆ ಎಷ್ಟು ಬಾರಿ ಆತಂಕ ಇಲ್ಲವೇ ಅಹಿತಕರ ಮನಸ್ಥಿತಿ ಉಂಟಾಗಿದೆ?					
3. ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ನಿಮ್ಮ ಆತ್ಮವಿಶ್ವಾಸದ ಮೇಲೆ ಎಷ್ಟು ಬಾರಿ ಪರಿಣಾಮ ಬೀರಿದೆ?					
4. ನಿಮ್ಮ ಬಗ್ಗೆಯೇ ಇರುವ ನಿಮ್ಮ ಅಭಿಪ್ರಾಯದ ಮೇಲೆ ಎಷ್ಟು ಬಾರಿ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ಪರಿಣಾಮ ಬೀರಿದೆ?					
5. ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದಾಗಿ ನೀವು ಎಷ್ಟು ಬಾರಿ ಚಿಂತೆ ಇಲ್ಲವೇ ಆತಂಕಕ್ಕೆ ಒಳಗಾಗಿದ್ದೀರಾ?					
6. ಇತರರ ಜೊತೆ ಇರುವ ಸಂದರ್ಭದಲ್ಲಿ ನಿಮ್ಮ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದಾಗಿ ಎಷ್ಟು ಬಾರಿ ಕಿರಿಕಿರಿಯನ್ನು ಅನುಭವಿಸಿದ್ದೀರಾ?					
7. ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದಾಗಿ ಎಷ್ಟು ಬಾರಿ ಒತ್ತಡ ಇಲ್ಲವೇ ಸುಸ್ತನ್ನು ಅನುಭವಿಸಿದ್ದೀರಾ?					
8. ನಿಮ್ಮ ಕೆಲಸ ಕಾರ್ಯಗಳಲ್ಲಿ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ಎಷ್ಟು ಬಾರಿ ತಡೆ ಉಂಟು ಮಾಡಿದೆ?					
9. ನಿಮ್ಮ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ಎಷ್ಟು ಬಾರಿ ಅನಾನುಕೂಲವನ್ನುಂಟು ಮಾಡಿದೆ?					
10. ನಿಮ್ಮ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದಾಗಿ ನೀವು ಎಷ್ಟು ಬಾರಿ ಸಾಮಾಜಿಕ ಸಂದರ್ಭಗಳಿಂದ ದೂರ ಉಳಿದಿದ್ದೀರಾ?					
11. ನಿಮ್ಮ ಸಾಮಾಜಿಕ ಅಥವಾ ವೈಯಕ್ತಿಕ ಜೀವನದಲ್ಲಿ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ಎಷ್ಟು ಬಾರಿ ಅಡಚಣೆಯನ್ನುಂಟು ಮಾಡಿದೆ?					
12. ನಿಮ್ಮ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ನಿಮ್ಮನ್ನು ಎಷ್ಟು ಬಾರಿ ಬೇರೆ ವಿಷಯಗಳಿಂದ ಬೇರ್ಪಡಿಸಿದೆ?					
ಅಂಕ :-	ಭಾವನಾತ್ಮಕ ಪ್ರಮಾಣ: 1-7 ಪ್ರಶ್ನೆಗಳು		ಸಾಮಾಜಿಕ ಪ್ರಮಾಣ: 8-12 ಪ್ರಶ್ನೆಗಳು		

APPENDIX 2

ಅಂತರಾಷ್ಟ್ರೀಯ ಪರಿಣಾಮ ತಪಶೀಲ ಪಟ್ಟಿ - ಹಿಯರಿಂಗ್ ಏಡ್ಸ್

1. ನಿಮ್ಮ ಈಗಿನ ಶ್ರವಣೋಪಕರಣಗಳನ್ನು (ಹಿಯರಿಂಗ್ ಏಡ್ಸ್) ಕಳೆದ ಎರಡು ವಾರಗಳಲ್ಲಿ ದಿನಕ್ಕೆ ಅಂದಾಜು ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ಉಪಯೋಗಿಸಿರುವಿರಿ?

ಉಪಯೋಗಿಸಿಯೇ ಇಲ್ಲ	1ಗಂಟೆಗಿಂತ ಕಡಿಮೆ	1ರಿಂದ4 ಗಂಟೆಗಳು	4ರಿಂದ8 ಗಂಟೆಗಳು	8ಗಂಟೆಗಿಂತ ಅಧಿಕ
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. ಈ ಶ್ರವಣೋಪಕರಣವನ್ನು ಪಡೆಯುವ ಮುನ್ನ ನಿಮಗೆ ತುಂಬಾ ಅವಶ್ಯಕವೆನಿಸುವ ಸಂದರ್ಭದಲ್ಲಿನ ಕೇಳುವಿಕೆಯ ಕುರಿತು ಯೋಚಿಸಿ. ಅಂತಹ ಸಂದರ್ಭದಲ್ಲಿ ನಿಮ್ಮ ಈಗಿನ ಹಿಯರಿಂಗ್ ಏಡ್ಸ್ ಕಳೆದರೆಡು ವಾರಗಳಲ್ಲಿ ಎಷ್ಟು ಸಹಾಯ ಮಾಡಿದೆ?

ಯಾವುದೇ ಸಹಾಯ ಮಾಡಿಲ್ಲ	ಸ್ವಲ್ಪ ಸಹಾಯ ಮಾಡಿದೆ	ಸಾಧಾರಣವಾಗಿ ಸಹಾಯ ಮಾಡಿದೆ	ಸಾಕಷ್ಟು ಸಹಾಯ ಮಾಡಿದೆ	ತುಂಬಾ ಹೆಚ್ಚು ಸಹಾಯ ಮಾಡಿದೆ
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. ನಿಮಗೆ ಕೇಳಿಸಿಕೊಳ್ಳುವುದು ತುಂಬಾ ಅವಶ್ಯಕವೆನಿಸುವ ಸಂದರ್ಭದ ಕುರಿತು ಮತ್ತೊಮ್ಮೆ ಯೋಚಿಸಿ, ಅಂತಹ ಸಂದರ್ಭದಲ್ಲಿ ಈಗಿನ ಶ್ರವಣೋಪಕರಣ ಉಪಯೋಗಿಸುವಾಗ ಈಗಲೂ ಎಷ್ಟು ಕಷ್ಟವನ್ನು ಅನುಭವಿಸುತ್ತಿರುವಿರಿ.

ತುಂಬಾ ಕಷ್ಟವಾಗುತ್ತದೆ	ಸಾಕಷ್ಟು ಕಷ್ಟವಾಗುತ್ತದೆ	ಮಧ್ಯಮವಾಗಿ ಕಷ್ಟವಾಗುತ್ತದೆ	ಸ್ವಲ್ಪ ಕಷ್ಟವಾಗುತ್ತದೆ	ಯಾವುದೇ ಕಷ್ಟವಿಲ್ಲ
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. ಎಲ್ಲಾ ಸನ್ನಿವೇಶಗಳನ್ನು ಪರಿಗಣಿಸಿದಲ್ಲಿ ಈಗಿನ ಶ್ರವಣೋಪಕರಣ ನಿಮ್ಮ ತೊಂದರೆಗೆ ಯೋಗ್ಯವಾಗಿದೆ ಎಂದು ಅನಿಸಿದೆಯೇ?

ಯೋಗ್ಯವೇ ಅಲ್ಲ,	ಸ್ವಲ್ಪ ಯೋಗ್ಯವಾಗಿದೆ	ಮಧ್ಯಮವಾಗಿ ಯೋಗ್ಯವಾಗಿದೆ	ಸಾಕಷ್ಟು ಯೋಗ್ಯವಾಗಿದೆ	ತುಂಬಾ ಹೆಚ್ಚು ಯೋಗ್ಯವಾಗಿದೆ
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. ಕಳೆದ ಎರಡು ವಾರಗಳಲ್ಲಿ ಶ್ರವಣೋಪಕರಣ ಉಪಯೋಗಿಸಿದ ನಂತರ ನಿಮ್ಮ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದ ನೀವು ಮಾಡುವ ಕೆಲಸಗಳ ಮೇಲೆ ಎಷ್ಟು ಪರಿಣಾಮ ಬೀರಿದೆ?

ತುಂಬಾ ಹೆಚ್ಚು ಪರಿಣಾಮ ಬೀರಿದೆ	ಸಾಕಷ್ಟು ಪರಿಣಾಮ ಬೀರಿದೆ	ಮಧ್ಯಮವಾಗಿ ಪರಿಣಾಮ ಬೀರಿದೆ	ಸ್ವಲ್ಪ ಪರಿಣಾಮ ಬೀರಿದೆ	ಯಾವುದೇ ಪರಿಣಾಮ ಬೀರಿಲ್ಲ
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. ಕಳೆದರೆಡು ವಾರಗಳಲ್ಲಿ ಶ್ರವಣೋಪಕರಣ ಉಪಯೋಗಿಸಿದರೂ ನಿಮ್ಮ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ಇತರರನ್ನು ಎಷ್ಟು ತೊಂದರೆಗೀಡು ಮಾಡಿದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆ.

ತುಂಬಾ ಹೆಚ್ಚು ತೊಂದರೆ ಮಾಡಿದೆ	ಸಾಕಷ್ಟು ತೊಂದರೆ ಮಾಡಿದೆ	ಮಧ್ಯಮವಾಗಿ ತೊಂದರೆ ಮಾಡಿದೆ	ಸ್ವಲ್ಪ ತೊಂದರೆ ಮಾಡಿದೆ	ಯಾವುದೇ ತೊಂದರೆಯಾಗಿಲ್ಲ
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX 3

ರೋಗಿಯ ಸಂವಹನ ಶಕ್ತಿಯ ಸ್ವಯಂ ಮೌಲ್ಯ ಮಾಪನ						
<p>ಸೂಚನೆ: ಈ ನಮೂನೆಯ ಉದ್ದೇಶ ನಿಮ್ಮ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದ ಆಗಿರುವಂತಹ ಸಂಭಾಷಣೆಯಲ್ಲಿನ ಸಮಸ್ಯೆಗಳನ್ನು ಗುರುತಿಸುವುದು. ನೀವು ಹಿಯರಿಂಗ್ ಏಡ್‌ಅನ್ನು ಧರಿಸುವಲ್ಲಿ, ಧರಿಸಿದ ನಂತರ ಹೇಗೆ ಸಂಭಾಷಿಸುವಿರಿ ಎಂಬುದರ ಬಗೆಗಿನ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ.</p>						
<p>ಬಲಗಡೆ ಇರುವ 5ರಲ್ಲಿ 1ವಿವರಣೆಯನ್ನು ಈ ಕೆಳಗಿನ ಹೇಳಿಕೆಗೆ ಹೊಂದಿಸಿ. ಕೆಳಗಿನ ಹೇಳಿಕೆಗಳಿಗೆ 1 ರಿಂದ 5 ರಲ್ಲಿ ಯಾವುದಾದರೂ ಒಂದು ಅಂಕಿಯನ್ನು ಆಯ್ಕೆ ಮಾಡಿ. ದಯಮಾಡಿ 'ಹೌದು' ಅಥವಾ 'ಇಲ್ಲ' ಎಂದು ಉತ್ತರಿಸಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೂ ಒಂದು ಉತ್ತರವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ.</p>	<p>(1) ಹೆಚ್ಚು ಕಡಿಮೆ ಯಾವಾಗಲೂ ಇಲ್ಲ/ಯಾವಾಗಲೂ ಇಲ್ಲ (2) ಕೆಲವು ಬಾರಿ (1/4 ರಷ್ಟು ಸಮಯ) (3) ಸುಮಾರು 1/2 ರಷ್ಟು ಸಮಯ (4) ಪದೇ ಪದೇ (3/4 ಭಾಗದಷ್ಟು ಸಮಯ) (5) ಪ್ರಾಯೋಗಿಕವಾಗಿ ಯಾವಾಗಲೂ/ಯಾವಾಗಲೂ</p>					
<p>1) ಇನ್ನೊಬ್ಬರ ಜೊತೆ ಮಾತನಾಡುವಾಗ ನಿಮಗೆ ಸಮಸ್ಯೆಗಳಿವೆಯೇ? (ಮನೆಯಲ್ಲಿ, ಕಛೇರಿಯಲ್ಲಿ, ಸಾಮಾಜಿಕ ಸಂದರ್ಭದಲ್ಲಿ, ಪರಿಚಾರಕಿಯ (ವೇಯಿಟ್ರಿಸ್) ಜೊತೆ, ಅಂಗಡಿಯವನ ಜೊತೆ, ಸಂಗಾತಿಯೊಡನೆ, ಮೇಲಾಧಿಕಾರಿಯೊಡನೆ ಇತರೆ)</p>	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5		
<p>2) ದೂರದರ್ಶನ (ಟಿ. ವಿ) ನೋಡುವಾಗ ಇಲ್ಲವೇ ಇತರ ಮನರಂಜನಾ ಕಾರ್ಯಕ್ರಮಗಳಲ್ಲಿ ಇರುವಾಗ ಸಮಸ್ಯೆಗಳಿವೆಯೇ? ಉದಾ: ಚಲನಚಿತ್ರ, ಆಕಾಶವಾಣಿ (ರೇಡಿಯೋ), ನಾಟಕಗಳು, ರಾತ್ರಿ ಸಂಘಗಳು (ಕ್ಲಬ್), ಸಂಗೀತ ಮನೋರಂಜನೆಗಳು ಇತರೆ.</p>	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5		
<p>3) ಚಿಕ್ಕ ಗುಂಪಿನಲ್ಲಿ ಹಲವು ವ್ಯಕ್ತಿಯೊಡನೆ ಸಂಭಾಷಿಸುವಾಗ ಸಮಸ್ಯೆಯಾಗುತ್ತಿದೆಯೇ? (ಸ್ನೇಹಿತರೊಡನೆ, ಕುಟುಂಬದವರೊಡನೆ, ಸಹವ್ಯೋಗಿಗಳೊಡನೆ, ಸಭೆಗಳಲ್ಲಿ ಹರಟೆ ಒಡೆಯುವಾಗ, ರಾತ್ರಿ ಊಟದ ಸಮಯದಲ್ಲಿ, ಇಸ್ಪೀಟು ಆಡುವಾಗ ಇತರೆ)</p>	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5		
<p>4) ಅನಾನುಕೂಲವಾದ ಕೇಳುವಿಕೆಯ ಸಂದರ್ಭಗಳಲ್ಲಿ ಸಂಭಾಷಿಸಲು ತೊಂದರೆಯಾಗುತ್ತಿದೆಯೇ? (ಗದ್ದಲಮಯ ವಿನೋದಕೂಟ (ಪಾರ್ಟಿ)ಗಳು, ಹಿನ್ನೆಲೆ ಸಂಗೀತವಿರುವಲ್ಲಿ, ಆಟೋ/ಬಸ್‌ನಲ್ಲಿ ಸಂಚರಿಸುವಾಗ, ಯಾರಾದರೂ ಪಿಸುಗುಟ್ಟಾಗ, ಮತ್ತೊಂದೆ ಕೋಣೆಯಿಂದ ಮಾತನಾಡಿದಾಗ ಇತರೆ)</p>	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5		
<p>5) ಚೆನ್ನಾಗಿ ಕೇಳಿಸಿಕೊಳ್ಳಲು ಬಯಸುವ ಸಂದರ್ಭಗಳಲ್ಲಿ ಎಷ್ಟು ಬಾರಿ ಸಂಭಾಷಣೆಯಲ್ಲಿ ತೊಂದರೆ ಉಂಟಾಗಿದೆ? ಸಂದರ್ಭ ತಿಳಿಸಿ - _____</p>	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5		
<p>6) ಪರಿಸರದಲ್ಲಿನ ಮೆದು, ಮಧ್ಯಮ ಹಾಗೂ ಜೋರಾದ ಶಬ್ದಗಳನ್ನು ಸರಿಯಾಗಿ ಕೇಳಲು ತೊಂದರೆ ಇದೆಯೇ? (ದೂರವಾಣಿ ಕರೆ, ಕರೆಗಂಟೆ /ಕಾಲಿಂಗ್ ಬೆಲ್), ವಾಹನ ಸಂಚಾರ ಶಬ್ದ/ಹಾರನ್, ಅಲರಾಮ್ ಇತರೆ)</p>	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5		
<p>7) ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿಂದಾಗಿ ನಿಮ್ಮ ವೈಯಕ್ತಿಕ ಅಥವಾ ಸಾಮಾಜಿಕ ಜೀವನದ ಮೇಲೆ ನಕಾರಾತ್ಮಕ ಪರಿಣಾಮಗಳು ಅಥವಾ ಅಡಚಣೆಗಳು ಉಂಟಾಗಿವೆಯೇ?</p>	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	1	2	3	4	5
1	2	3	4	5		

8)	ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ನಿಮ್ಮನ್ನು ಕಾಡುತ್ತಿದೆಯೇ, ಯೋಚನೆ ಉಂಟು ಮಾಡಿದೆಯೇ ಇಲ್ಲವೇ ಬೇಜಾರು ಗೊಳಿಸಿದೆಯೇ?	1	2	3	4	5
9)	ನಿಮಗೆ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯಿದೆ ಎಂದು ಇತರರು ಎಷ್ಟು ಬಾರಿ ಕಳಕಳಿ ತೋರಿಸಿದ್ದಾರೆ ,ಇಲ್ಲವೇ ತಾವಾಗಿಯೇ ಸಲಹೆ ನೀಡಿದ್ದಾರೆ?	1	2	3	4	5
10)	ನಿಮ್ಮ ಸಂತಸದ ಜೀವನದ ಮೇಲೆ ಕೇಳುವಿಕೆಯ ತೊಂದರೆಯು ಎಷ್ಟು ಬಾರಿ ನಕರಾತ್ಮಕ ಪರಿಣಾಮ ಬೀರಿದೆ?	1	2	3	4	5
11)	ನೀವು ಹಿಯರಿಂಗ್ ಏಡ್‌ಅನ್ನು ಉಪಯೋಗಿಸುತ್ತಿದ್ದಲ್ಲಿ, ದಿನಕ್ಕೆ ಸರಾಸರಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ಉಪಯೋಗಿಸುತ್ತೀರಾ? ಗಂಟೆಗಳು - /16= %					
12)	ನಿಮ್ಮ ಶ್ರವಣ ಸಾಧನದ ಬಗ್ಗೆ ಒಟ್ಟಾರೆ ತೃಪ್ತಿ / ಸಮಾಧಾನವನ್ನು ತಿಳಿಸಿ: 1. ಸಮಾಧಾನವೇ ಇಲ್ಲ (0%) <input type="checkbox"/> 2. ಸ್ವಲ್ಪ ಸಮಾಧಾನ (25%) <input type="checkbox"/> 3. ಸಾಧಾರಣವಾದ ಸಮಾಧಾನ (50%) <input type="checkbox"/> 4. ಸಾಕಷ್ಟು ಸಮಾಧಾನ (75%) <input type="checkbox"/> 5. ತುಂಬಾ ಸಮಾಧಾನ (100%) <input type="checkbox"/>					

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