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A Study to Assess the Prevalence of Overt Hearing Loss in Geriatric Population in Rural Tamil Nadu - A Community Based Cross Sectional Study

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ABSTRACT

Introduction: The world's ageing population is going through a crisis of hearing loss that isn't getting enough attention. It is the third most common cause of years lived with a handicap in the world, and it affects more than 25% of adults over 60. In India, especially in rural Tamil Nadu, the rate of geriatric diseases is seventy-two percent because of untreated infections, noise, and poor healthcare. People often think that this invisible handicap as just a normal part of getting old, yet it can cause significant social isolation, speed up cognitive decline, and lead to melancholy. Because much of the data we have comes from hospital records, we need community-based studies right once to find out the real burden, plan solutions, and make sure that seniors may age in a healthy and dignified way.

Material and methods: This was a community-based cross-sectional study conducted among the elderly population in the rural field practice regions of a semi-rural tertiary care teaching hospital in South India, namely from villages participating in the Family Adoption Program (FAP) of this medical college.

Results: This study included 260 rural elderly persons (mean age 71 yrs; 136 females, 124 males) to determine the prevalence and psychosocial effects of hearing loss. Clinical evaluations indicated that 54.2% had normal hearing, whereas 45.8% demonstrated significant hearing loss, comprising 68 bilateral and 51 unilateral instances. The questionnaire brought to light major psychosocial problems. The most common problem was understanding whispered communication, which affected 41.5% of the people who took part. Hearing problems made 14.2% of the group feel embarrassed when they met new people, and they caused fights in families for 52 persons. Also, 19 people said they felt disabled, and their everyday activities or social events were clearly affected.

Conclusion: Age-related hearing loss necessitates comprehensive interventions that extend beyond mere clinical diagnosis. Some of the most important suggestions are full rehabilitation, family counselling, regular primary health care examinations, financial help for hearing aids, and public infrastructure plans that incorporate everyone.

Keywords: Overt hearing loss, Presbycusis, Psychosocial Distress

INTRODUCTION

There is a huge change happening in the world's population. Life expectancy has increased because of better medical technology and living conditions. This has led to a quickly growing population of elderly people. But this "longevity revolution" also means that more people are getting chronic, age-related diseases. One of the most common but least understood problems is presbycusis, or hearing loss that comes with age. Hearing loss in the elderly is frequently regarded as an unavoidable consequence of ageing; yet, it constitutes a significant social and psychological impediment that remains predominantly obscured in middle income countries like India, especially in rural regions of some states such as rural Tamil Nadu (1,2).

Hearing loss is now the third most common cause of years lived with disability (YLD) in the world. The World Health Organization (WHO) says that more than 1.5 billion individuals around the world have some kind of hearing loss. This number might grow to 2.5 billion by 2050. More than 25% of those over 60 have hearing loss that makes it hard for them to hear (1).

The prevalence is not the same everywhere; it is much greater in low- and middle-income nations because they have less access to preventative treatment and are more exposed to environmental risk factors. The World Health Organization (WHO) says that the cost of hearing loss that isn't handled is more than $980 billion a year. This is because of healthcare costs, educational support, and loss of productivity. Even though these numbers are shocking, stories about global health frequently focus on communicable diseases that can kill people instead of sensory impairments. This leaves elderly people in a "silent" fight (2).

By 2050, around 20% of India's population is expected to be elderly. The National Sample Survey Office (NSSO) says that hearing loss is the second most common cause of disability in the country. Research undertaken under the National Programme for Prevention and Control of Deafness (NPPCD) indicates that over 6.3% of the Indian population experiences considerable hearing impairment (3,4). However, when we look only at the elderly population, the prevalence rates are much higher. Different community-based studies in India have found that 45% to 72% of people over 60 have the disease. In rural India, these statistics are exacerbated by the absence of specialised ENT care, insufficient understanding of ear cleanliness, and the prevalence of chronic suppurative otitis media (CSOM) that remains untreated from childhood (5).

Tamil Nadu is one of the states in India that is becoming older the fastest. The state's healthcare system is strong, yet there is still a big difference between cities and rural areas. Localised research in Tamil Nadu have shown that hearing loss is more common in elderly population living in rural areas than it is in the urban pockets. Long-term exposure to agricultural noise, not getting enough nutrients, and the exorbitant expense of digital hearing aides are all things that make this problem worse. In rural Tamil Nadu, the "stigma of the machine" (the hearing aid) and the cultural acceptance of "hardness of hearing" as a natural consequence of ageing contribute to a low propensity for seeking health care. Many older people in these communities still don't recognise they have hearing loss, which is obvious to others but sometimes not acknowledged by the patient or disregarded by the family (6).

People commonly call hearing loss a "invisible disability." Hearing loss, on the other hand, cuts the person off from the outside world. In older people, this isolation causes a terrible chain of psychosocial problems, such as cognitive decline, which is a known link between untreated hearing loss and the quickening of dementia and Alzheimer's disease, and mental health disorders. Not being able to talk to relatives or participate in community events can cause melancholy, anxiety, and a deep sense

of loneliness. It can also put your safety at risk. People with overt hearing loss are at risk of physical harm since they can't hear cars or alarms coming (7,8).

Even with these dangers, hearing health is not often included in routine geriatric care. In rural areas where families are moving from joint to nuclear, older people often feel left out. The issue is "hidden" because hearing loss doesn't "hurt" or "kill" right away, so it's not a high priority for rural families that don't have a lot of money (1,7).

There is a significant deficiency of current, community-specific data concerning the prevalence of overt hearing loss in rural Tamil Nadu. Most current data are derived from hospitals, which does not accurately reflect the actual community burden, as numerous elderly population do not access tertiary care facilities (6). This study seeks to address such deficiency. By using a community-based cross-sectional method to find out how common overt hearing loss is, we can show how serious this sensory loss is. This issue must be dealt with not only for medical reasons but also for social ones in order to promote "Healthy Ageing" and restore the dignity and social integration of our older citizens.

MATERIALS & METHODS

Study Design: This was a community-based cross-sectional study carried out among elderly population in the rural field practice areas of a semirural tertiary care teaching hospital in south India from villages under Family Adoption Program (FAP) of this medical college between April 2025 to August 2025. The protocol was approved by the institutional ethics committee, and written informed consent was obtained from all the participants.

Study Population: Individuals aged 60 years and above residing in the selected rural areas for at least six months.

Sample Size Calculation: Using the formula n=Z^2pq/d^2n equals cap Z squared p q / d squared, $n=Z^2pq/d^2$. p (Prevalence): Based on a study in Tamil Nadu (13), a prevalence of 29.5% is considered, d (Relative Error): 20% of prevalence, Confidence Level: 95%. Final sample size was adjusted for a non-response rate of 10%. The sample size thus calculated was 260

Inclusion and Exclusion Criteria:

Inclusion criteria:

1. Elderly people > 60 years of age on the day of interview
2. All genders are included.

Exclusion criteria:

1. Anyone not consenting to participate in this study.
2. Those who have already taken medical/surgical treatment for ear diseases. 3. Those who have already been assessed for hearing loss before.

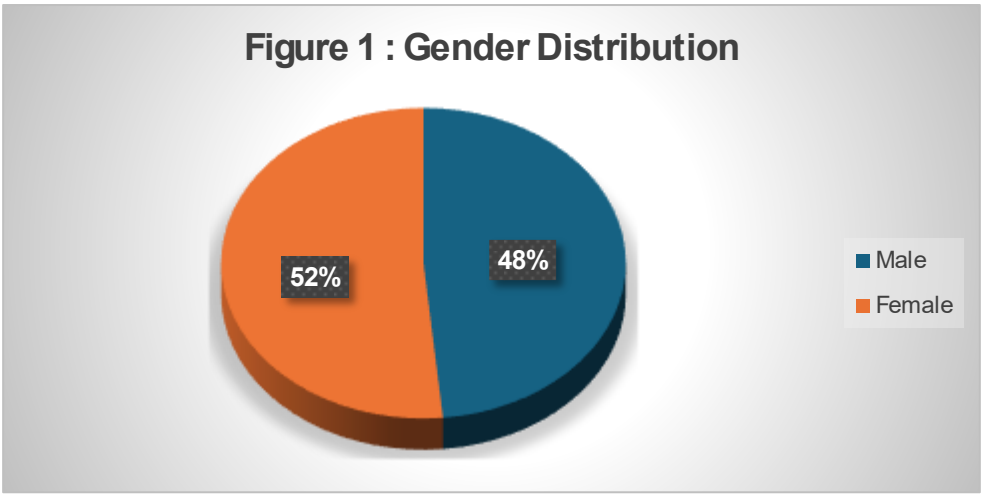
Data collection: Family Adoption Programme as per NMC curriculum is already existent in this institution wherein students visit families adopted by them once a month. These visits will be used to meet the study population and collect data by the primary investigator. Hearing loss will be assessed based on the HHIE-S(hearing handicap inventory for the elderly: screening version. This questionnaire was chosen as it has been pre validated (by Deepthi et al in their study (9)) as a screening test for hearing impairment in the elderly and found easy to administer. Based on the eligibility criteria, the elderly who have not visited any health facility for hearing related consultation were recruited, after getting the informed consent. They were administered the questionnaire by the interviewer and subjected to free field hearing test to quantify the hearing loss.

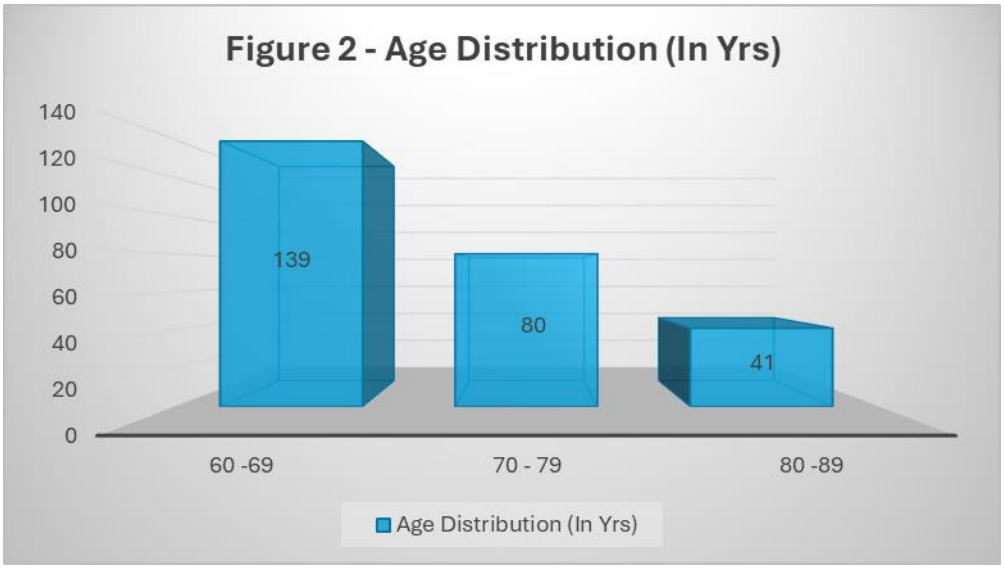
Data Analysis: The collected data from the interview was entered in Microsoft excel spreadsheet. Categorical variables were summarized as percentages; subjective data was summarized separately accordingly.

RESULT

The study examined a group of 260 elderly individuals living in rural settings to assess

the prevalence and psychosocial effects of hearing loss. This focus addresses the acknowledged necessity for screening among this group, as elderly population in rural regions are more prone to experiencing hearing loss than their urban counterparts.

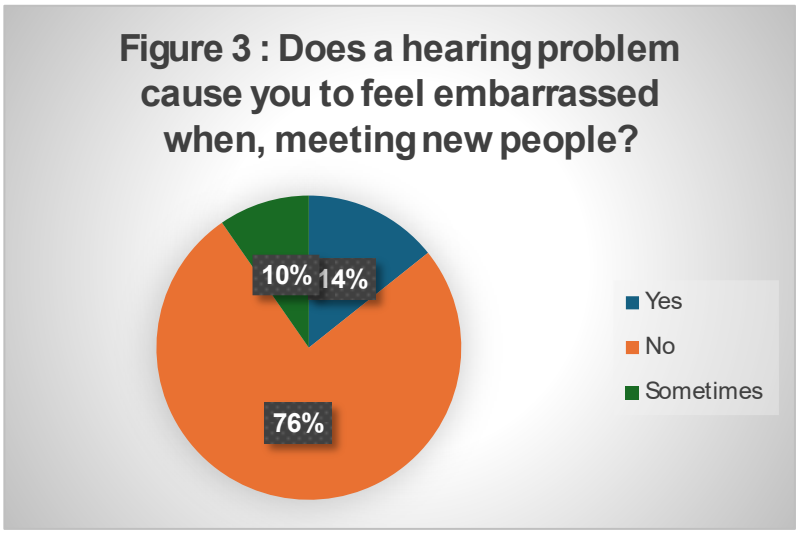




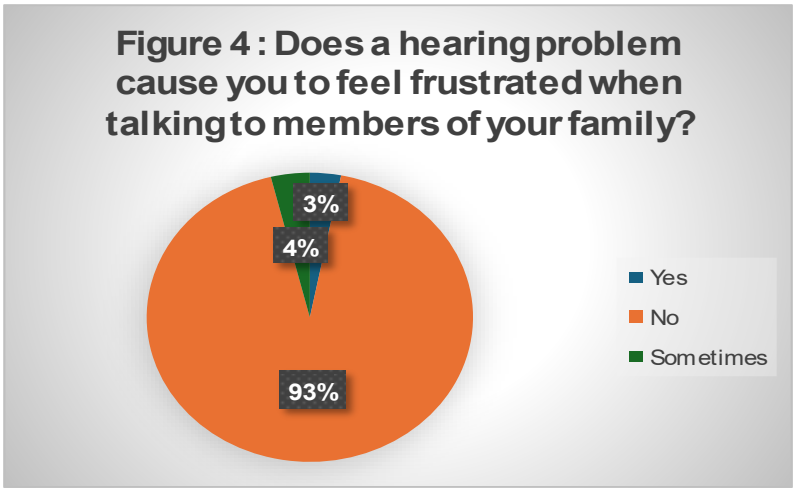
The gender distribution of the sample was relatively balanced, comprising 136 females and 124 males. The mean age of the cohort was 71 years.

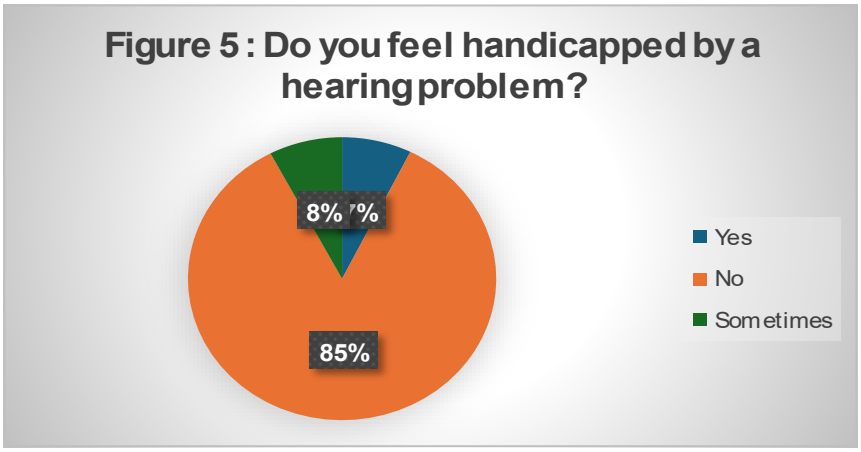
Psychosocial and Interpersonal Impact

Hearing difficulties also impacted broader social interactions, which aligns with findings that poor hearing status can adversely affect emotional and social loneliness in the elderly. Feeling embarrassed when meeting new people was noted by 37(14%) participants, with an additional 25 (~10%) feeling this way occasionally. (Figure 3)

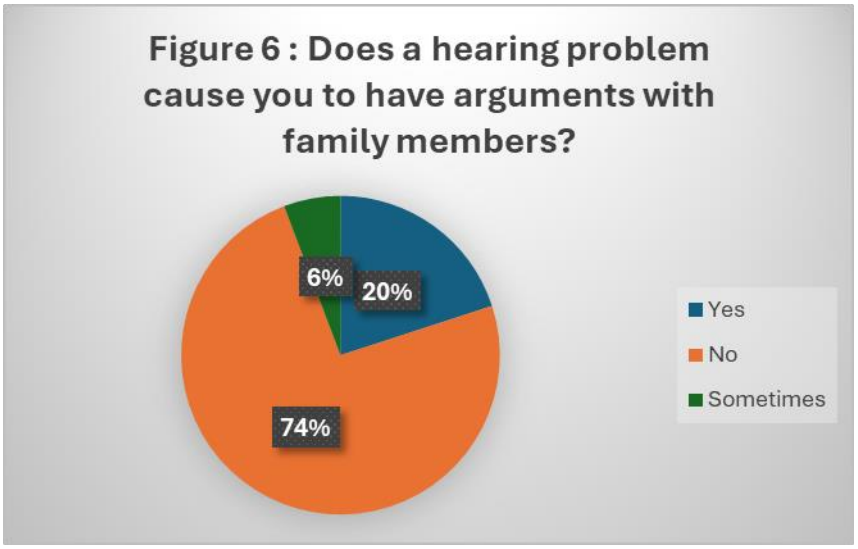


The HHIE-S questionnaire showed that people had different levels of social, emotional, and communication problems. This supports the idea that hearing loss that comes with age can make it hard to talk to people. Around 7% of our respondents had a feeling of frustration while communicating with their family. Of these 4% felt this way most of the time,3% feeling occasionally. The similar number of respondents also felt handicapped due to their hearing impairment. (Figure 4 and 5)

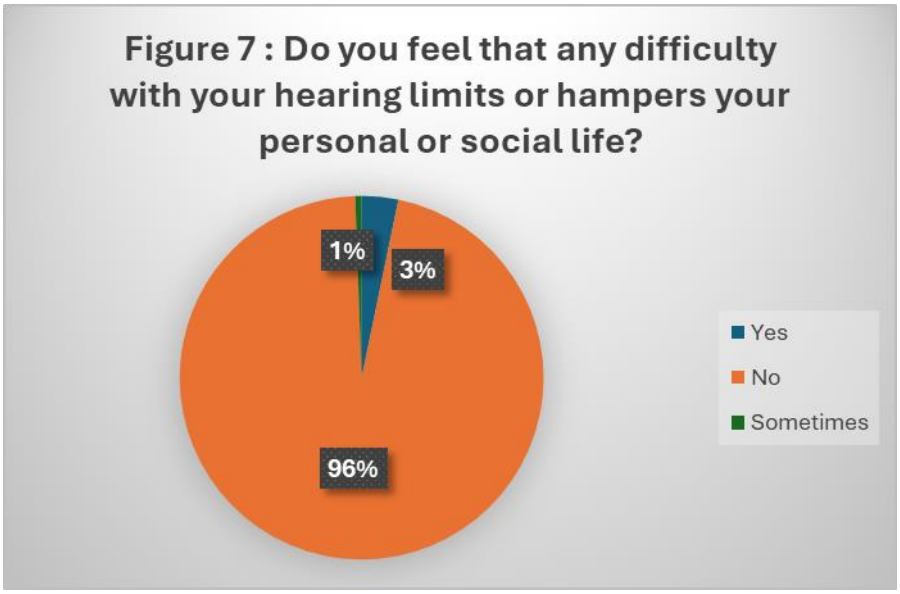




Reduction in hearing causes difficulty in communication within the family, leading to arguments within the family leading to stress. Fifty-two (20%) respondents said they had regular fights with family members because they couldn't hear well, whereas fifteen (6%) said this happened to them sometimes. (Figure 6)

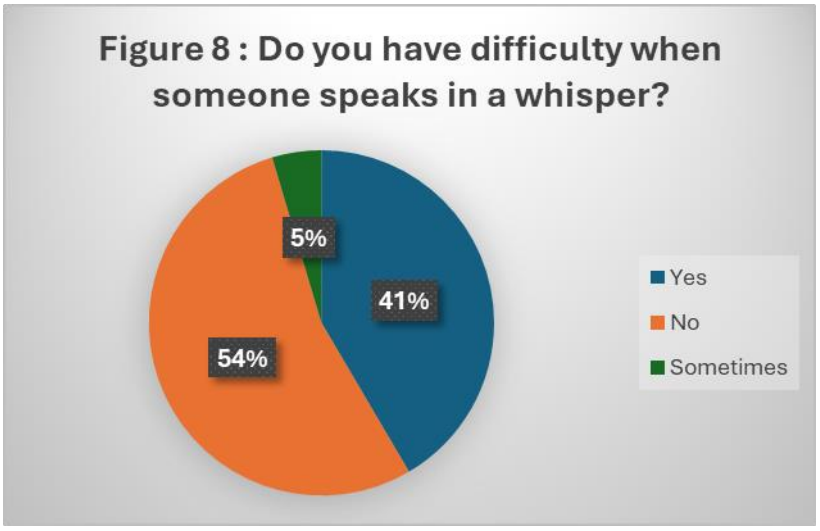


Surprisingly, the effect on personal and social life was very less with only 4% of respondents answering affirmatively. This could be due to avoidance of the uncomfortable situations by those with hearing reduction in anticipation itself. (Figure 7)

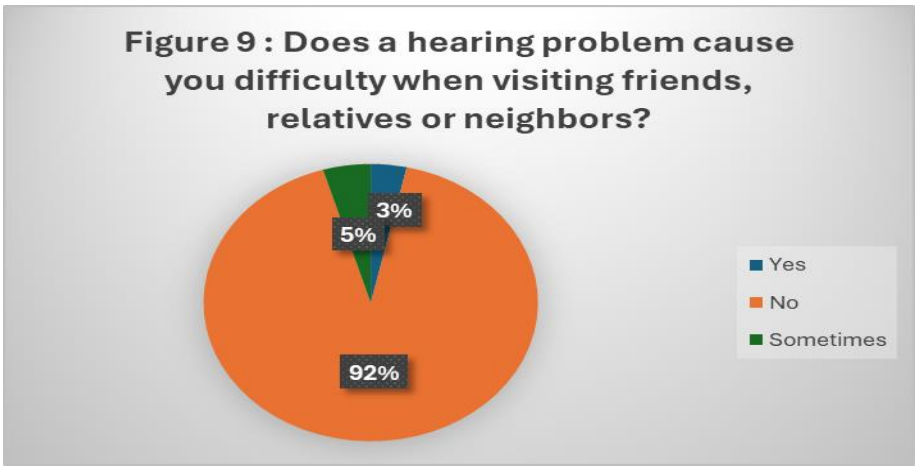


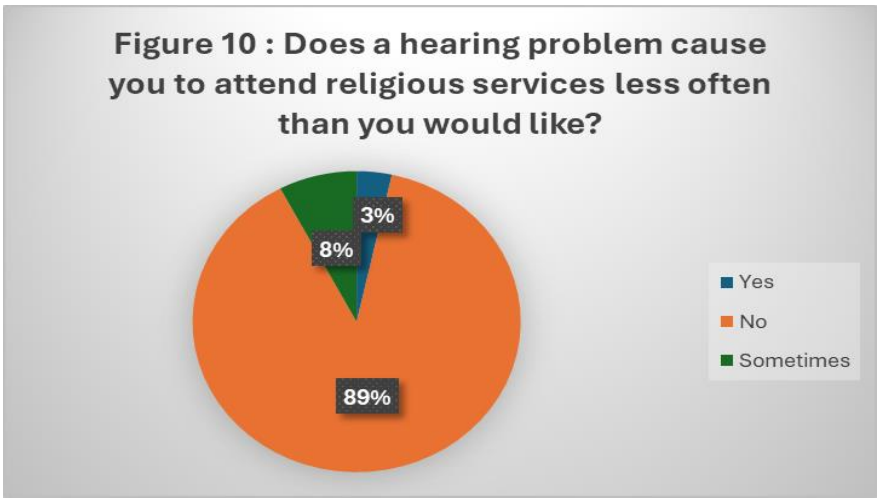
Quality of Life and Societal Implications

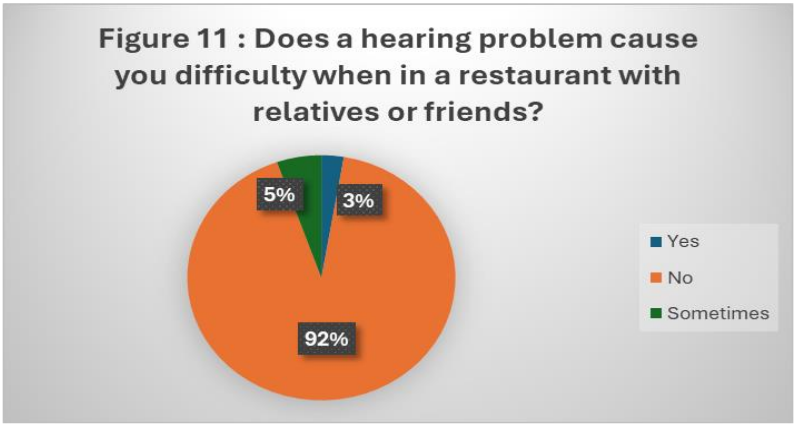
The most common problem was understanding whispered communication. 108 (41.5%) respondents had trouble understanding while spoken to in whispers most of the time whereas 12(5%) said they had occasional issue with it. This could be due to the fact that whispered speech is usually in high frequency which corresponds to the age-related hearing loss. (Figure 8)



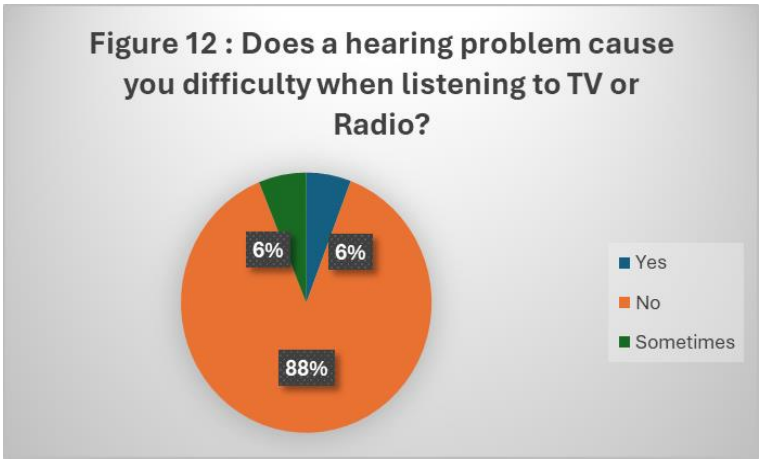
A smaller group of people in the study said that their hearing problem made it hard for them to be socially active whether it was visiting friends, relatives, neighbours or attending a religious service or dining with relatives/friends in a restaurant. About 8% of respondents had difficulty while visiting friends, relatives and neighbour. (Figure 7) Similar number of respondents had issues while dining in a restaurant with family and friends. (Figure 12). Another 11 % respondents felt difficulty in attending religious services due to reduced hearing (Figure 9, 10 and 11).



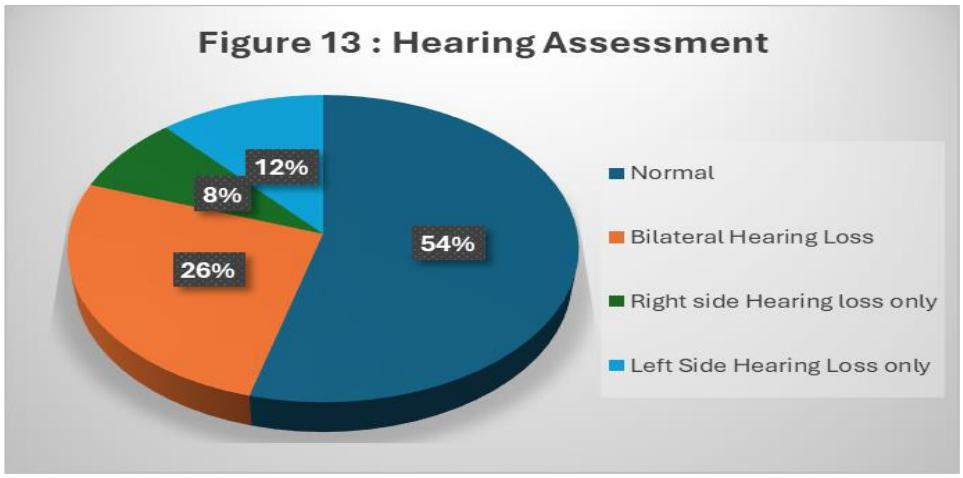




The hearing reduction had affected simple routine activities such as watching a TV or listening to radio. Fifteen (~6%) respondents said they had trouble listening to the TV or radio on a day-to-day basis and a similar number of them had issues occasionally. (Figures 12)



The clinical evaluation using free field hearing test, showed that 141 people (54.2%) had normal hearing. The other 119 subjects (45.8%) had hearing loss. Among persons with hearing impairment, bilateral hearing loss was the most common manifestation in 68 individuals. Unilateral impairment was seen in 51 people, 30 of whom had hearing loss on the left side and 21 of whom had hearing loss on the right side. (Figure 13)



DISCUSSION

The demographic transition towards an ageing populace poses a significant public health concern, with age-related hearing loss (presbycusis) emerging as a pivotal impediment to "Healthy Ageing." Addressing this sensory impairment is not just a medical necessity but also a social imperative vital for maintaining the dignity and inclusion of the elderly. Our community-based cross-sectional study assessed 260 elderly persons (mean age 71 years; 48% male, 52% female), employing both objective audiometric evaluations and a self-assessment questionnaire to gauge emotional and social-situational effects. The results provide essential insights into the severity and psychosocial aspects of this illness in comparison to current literature.

Our objective hearing evaluations indicated that 45.8% (119/260) of the individuals demonstrated some degree of hearing loss, with bilateral impairment as the predominant manifestation (26.2%), succeeded by isolated left-sided (11.5%) and right-sided (8.1%) deficiencies. This prevalence corresponds with the global consensus regarding the impact of presbycusis. For example, a community-based cross-sectional study of Thai seniors found that up to 52.4% of people over 60 years old were likely to have hearing loss (10). In a Brazilian cohort, objective audiometric hearing loss was identified in an astonishing 79.7% of older adults, underscoring the widespread prevalence of the disorder worldwide (11).

In the Indian context, hearing loss prevalence stands at 45.8% which falls between the two studies. A study in Aligarh found a lower general population frequency of 23.1%, but it also found that the prevalence rose sharply with age, reaching 75% in people over 70 years old (12). In contrast, a 2026 community-based study conducted by Vidhya et al. in Tamil Nadu reported a 65.1% prevalence of bilateral hearing loss among older persons chronically exposed to ambient industrial noise, in comparison to 35.1% in unexposed controls (13). Our results indicate a typical semi-rural/rural elderly population, with about fifty percent exhibiting auditory impairment by their early seventies.

The self-assessment questionnaire yielded the most significant findings of our investigation, revealing a substantial disparity between objective auditory degradation and the subjective experience of a "handicap." While nearly half of the group reported objective hearing loss, very few of them openly admitted to having serious psychosocial problems. Only 7.3% (19/260) positively affirmed when asked if their hearing impairment made them feel handicapped, and only 3.1% (8/260) thought their hearing problem made their personal or social life worse. Even if they were stoic, small behavioral signs showed the hidden cost of the deficiency. A notable 41.5% (108/260) of respondents encountered challenges when addressed in a whisper, and 20% (52/260) indicated that a hearing impairment unequivocally led to disputes with family members. Also, 14.2% (37/260) of the interviewees said they were embarrassed when they met new people.

This normalization of sensory loss is a thoroughly documented occurrence. A Croatian validation study of the Hearing Handicap Inventory for the Elderly-Screening Version (HHIE-S) underscored that, although questionnaires are adept at detecting audiometric losses exceeding 20 dB, cultural norms that regard hearing loss as an unavoidable aspect of ageing frequently diminish self-reported emotional handicap scores (14). Elderly population often cope by subconsciously retreating instead than recognizing the impairment. Our data corroborates this: although overt expressions of isolation—such as evading religious services (3.5%), frustration from listening to the TV/Radio (5.8%), or challenges in restaurants (2.7%)—were diminished by the cohort, the prevalence of intra-familial disputes indicates an underlying, unrecognized psychosocial strain. Da Silva et al. asserted that diagnostic precision is contingent upon

patients' acknowledgement of specific environmental challenges, hence necessitating early screening to prevent dissatisfaction from escalating into enduring social isolation (11).

CONCLUSION

The results of this community-based study highlight that age-related hearing loss is not solely a physiological deterioration, but a complex public health issue. With almost half of the elderly group having objective hearing loss, and a large number of them feeling embarrassed, stressed out by family, and socially withdrawn as a result, it is clear that this sensory loss has far-reaching effects on their mental and social health. To attain authentic "Healthy Ageing," interventions must transcend mere clinical diagnosis and adopt a comprehensive, systematic methodology.

Based on our findings, we propose the following strategic recommendations to address the physical, psychological, and social burdens of hearing loss:

Mitigating Physical Disability and Psychosocial Distress

• Full Rehabilitation: To help people with physical disabilities, we need to make assistive listening devices like hearing aids and personal amplifiers widely available. However, just giving out gear is not enough.

• Psychological Support: To deal with the shame and anger seen in this study, audiological rehabilitation needs to be combined with psychological counselling. Support groups for seniors might assist people who are losing their hearing feel less ashamed about it.

• Family-Centered Interventions: Since 20% of participants said they had fights with family members, interventions should teach the patient's primary carers and family members how to talk to each other. Teaching families how to communicate well (such as facing the person, speaking properly instead of yelling, and keeping background noise to a minimum) can greatly lower tension at home and keep people from feeling alone.

Strengthening Primary Health Care (PHC)

Primary healthcare is the frontline of community medicine and must be empowered to manage age-related hearing loss proactively:

• Routine Geriatric Screening: Hearing tests should be a regular part of every geriatric check-up at the PHC level. It is easy to use simple, low-cost screening techniques like standardized whisper tests or portable audiometers.

• Capacity Building: Primary care doctors and community health professionals need to have specific training on how to spot the first signs of hearing loss and the psychosocial red flags that come with it (for example, suddenly stopping going to social or religious events).

• Streamlined Referral Pathways: PHCs need to set up efficient referral networks to connect patients with specialized audiology services. This will make sure that patients can easily move from community screening to clinical intervention.

Policy Initiatives and Systemic Change

To enact meaningful change, specific public health policies must be drafted to support the aging population:

• Financial help: The expensive expense of hearing aids is a big reason why many don't get treatment. Policies should be put in place to help pay for audiological tests and the purchase of hearing aids through national health insurance plans or programs for seniors.

• Public Awareness initiatives: Governments should start public health initiatives to get rid of the stigma around hearing loss. Teaching individuals how to talk to persons who are hard of hearing will make society more welcoming. This will immediately address the social anxiety and shame that older people feel when they meet new people.

• Accessible Infrastructure: Policies should require the addition of hearing-friendly infrastructure in public places. For example, induction loop systems should be put in

place in places like religious institutions, community centers, and government buildings so that older people can still be active members of society.

Ultimately, by strengthening primary healthcare and enacting supportive policies, we can bridge the gap between recognizing this sensory deficit and actively restoring the dignity, social integration, and overall quality of life for our elderly population.

Declaration by Authors

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