

Impact of Hearing Loss on Quality of Life among the Elderly: A Hospital-Based Cross-Sectional Study Using the HHIE-S Questionnaire

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ABSTRACT

Background: Presbycusis, or age-related hearing loss, is one of the most common sensory impairments among older adults and is associated with impaired communication, social isolation, depression, and reduced quality of life (QoL). Early identification of hearing handicap is essential for timely intervention and rehabilitation to improve functional independence and overall well-being. **Objectives:** The primary objective of this study was to assess the impact of hearing loss on quality of life among elderly individuals using the Hearing Handicap Inventory for the Elderly Screening (HHIE-S) questionnaire. The secondary objective was to determine the proportion of elderly individuals experiencing a perceived hearing handicap. **Materials and Methods:** A hospital-based cross-sectional observational study was conducted over a period of six months among 100 elderly individuals aged 60 years and above attending the ENT and Geriatric Outpatient Departments. Participants with severe cognitive impairment, recent ear surgery, or current hearing aid use were excluded. Data were collected using the validated Hearing Handicap Inventory for the Elderly Screening (HHIE-S) questionnaire. HHIE-S scores were categorized as no handicap (0–8), mild-to-moderate handicap (10–24), and significant handicap (26–40). Statistical analysis was performed using descriptive and inferential statistics, with a p-value of <0.05 considered statistically significant. **Results:** Among the 100 participants, 42% had no perceived hearing handicap, 34% had mild-to-moderate hearing handicap, and 24% had significant hearing handicap. The severity of hearing handicap increased with advancing age, with participants aged over 80 years demonstrating the highest mean HHIE-S scores. Hearing loss was associated with reduced social interaction, emotional distress, and diminished quality of life, indicating a substantial psychosocial impact among the elderly population. **Conclusion:** Hearing loss has a significant negative impact on the quality of life of elderly individuals, particularly affecting their social and emotional well-being. The HHIE-S questionnaire is an effective screening tool for identifying perceived hearing handicap in older adults. Routine screening, early audiological evaluation, and timely rehabilitation strategies are recommended to improve quality of life and promote healthy aging.

Keywords: Presbycusis, Hearing loss, Quality of life, Hearing Handicap Inventory for the Elderly–Screening (HHIE-S), Elderly, Hearing handicap, Audiology, Geriatrics.

INTRODUCTION

Presbycusis, or age-related hearing loss, refers to the hearing impairment specifically associated with the cochlear degenerative processes of aging. Clinically, it is defined as a bilateral, symmetrical, and slowly progressive condition. It stands as the most common sensory deficit in the elderly and is rapidly becoming a significant global social and health priority. As life expectancy increases due to improved nutrition and

healthcare, more individuals are living into their 60s, 70s, and 80s, leading to a higher prevalence of this condition. In the United Kingdom, approximately 75% of adults with hearing impairment are over the age of 60. Similarly, in the United States, it is estimated that 35–40 million senior citizens will have significant hearing loss by the year 2030.

The consequences of hearing loss in the elderly are profound, impacting their social, functional, and

psychological well-being. Because it disrupts the exchange of information, hearing loss is fundamentally a "social loss" that impairs the interactions essential for daily life. The deterioration of Quality of Life (QoL) is multidimensional, affecting an individual's physical, material, social, and emotional states. Affected persons frequently report severe emotional reactions, including loneliness, isolation, dependence, frustration, depression, and anxiety. Behavioral shifts, such as bluffing (pretending to understand) or withdrawing from social activities, are common, alongside cognitive difficulties like confusion, distracted thoughts, and reduced self-esteem.

A critical challenge in managing presbycusis is that clinicians are currently unable to remediate its progression. While family history and audiometric testing can determine the degree of impairment, they do not fully capture the impact on an individual's life. Consequently, optimal management must include a formal evaluation of QoL status. Studies indicate that individuals with hearing loss are significantly less satisfied with their "life as a whole," with only 39% perceiving an excellent global QoL compared to 68% of those with normal hearing.

Despite its prevalence, many elderly individuals are afraid to seek medical help or acknowledge hearing loss as a problem, which can lead to further disability and handicap. Early identification is therefore essential to initiate rehabilitation and teaching of coping strategies. The Hearing Handicap Inventory for the Elderly-Screening (HHIE-S) is a validated, 10-item tool specifically designed to measure the emotional and social effects of hearing impairment in this population. This study utilizes the HHIE-S in a hospital-based cross-sectional design to assess the impact of hearing loss on QoL and determine the proportion of elderly individuals experiencing a perceived handicap. By identifying these correlates, the study aims to support the necessity of early screening and awareness to improve the well-being and independence of the aging population.

We hypothesized that hearing loss is significantly associated with reduced quality of life among elderly individuals.

Limited hospital-based data are available regarding the impact of hearing loss on quality of life among the elderly in the Indian population.

METHODOLOGY

Study Design and Setting

This study utilized a hospital-based cross-sectional observational design. The study was conducted over a period of six months from **January 2025 to June 2025** within the ENT and Geriatric Outpatient Departments (OPD) to capture a representative elderly clinical population.

Ethical Approval

The study protocol was reviewed and approved by the Institutional Ethics Committee (IEC) of Department of Orthopaedics, Assistant professor, SSPM, Medical College and Lifetime Hospital, Sindhudurg, Maharashtra, India.

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (2013 revision).

Informed Consent

Written informed consent was obtained from all participants before enrolment in the study.

Sampling Technique

Consecutive sampling technique was used to recruit eligible participants until the required sample size was achieved.

A total of 100 elderly participants were included in the study using consecutive sampling during the study period. The sample size was determined based on feasibility and the availability of eligible participants attending the outpatient departments.

Inclusion Criteria:

- Age ≥ 60 years
- Clinically diagnosed or suspected hearing loss
- Willing to participate
- Provided written informed consent

Exclusion Criteria

- Conductive hearing loss
- Active ear infection
- Psychiatric illness
- History of cochlear implant
- Dementia
- Operational Definitions

Presbycusis

Age-related bilateral symmetrical sensorineural hearing loss.

Quality of Life

Measured using the Hearing Handicap Inventory for the Elderly-Screening (HHIE-S).

Hearing Handicap

Categorized according to HHIE-S score:

- 0–8: No handicap
- 10–24: Mild-to-moderate handicap
- 26–40: Significant handicap

Data Collection and Tools

Eligible participants were interviewed using a structured questionnaire after obtaining informed consent. Sociodemographic information including age, gender, educational status, occupation, and living status was recorded. The HHIE-S questionnaire was

administered by trained investigators in the participant's preferred language.

Scoring and Interpretation Each item on the HHIE-S was scored as follows: 'Yes' (4 points), 'Sometimes' (2 points), or 'No' (0 points). The total possible score is 40. Scores were categorized to define the level of perceived handicap:

- **0–8:** No handicap
- **10–24:** Mild-to-moderate handicap
- **26–40:** Significant handicap

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean $\pm$ standard deviation (SD), while categorical variables were presented as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test where appropriate. Continuous variables were compared using the independent

Student's t-test or one-way ANOVA. A p-value of <0.05 was considered statistically significant, and all statistical tests were two-tailed with a 95% confidence interval.

Study Variables

Independent Variables

- Age
- Gender
- Living status
- Educational status

Dependent Variables

- HHIE-S score
- Degree of hearing handicap
- Quality of life

Confidentiality

Participant confidentiality was maintained throughout the study by anonymizing all collected data and restricting access to the research team only.

RESULTS

A total of 100 elderly participants were included in the final analysis.

Table 1: Demographic Characteristics of the Study Population (N=100)

Variable	Frequency (n=100)	Percentage (%)
Age Group		
60–70 years	45	45%
71–80 years	35	35%
>80 years	20	20%
Gender		
Male	52	52%
Female	48	48%
Living Situation		
With Family	82	82%
Alone	18	18%

Observation:

The majority of participants (45%) belonged to the 60–70 years age group. Males constituted 52% of the study population, and most participants (82%) were living with their families.

Table 2: Distribution of Perceived Hearing Handicap (HHIE-S Scores)

Handicap Category	HHIE-S Score Range	Participants (n)	Percentage (%)
No Handicap	0–8	42	42%
Mild-to-Moderate	10–24	34	34%
Significant Handicap	26–40	24	24%

Observation:

Among the study participants, 42% had no perceived hearing handicap, whereas 34% had mild-to-moderate handicap and 24% had significant hearing handicap according to HHIE-S scores.

Table 3. Association Between Gender and Hearing Handicap (HHIE-S Categories)

Gender	No Handicap n (%)	Mild-to-Moderate n (%)	Significant Handicap n (%)	Total
Male	24 (46.2)	17 (32.7)	11 (21.1)	52
Female	18 (37.5)	17 (35.4)	13 (27.1)	48

Gender	No Handicap n (%)	Mild-to-Moderate n (%)	Significant Handicap n (%)	Total
Total	42 (42.0)	34 (34.0)	24 (24.0)	100

Chi-square = 0.84

p = 0.657

Observation:

Females demonstrated a slightly higher proportion of significant hearing handicap than males; however, the association between gender and hearing handicap was not statistically significant ($p > 0.05$).

Table 4: Self-Reported Emotional and Cognitive Reactions to Hearing Loss

Symptom	Frequency (n)	Percentage (%)
Social isolation	46	46.0
Loneliness	40	40.0
Frustration	38	38.0
Difficulty communicating	55	55.0
Anxiety	28	28.0
Depression	22	22.0
Reduced self-esteem	25	25.0
Withdrawal from social activities	36	36.0

Observation:

Difficulty in communication (55%) and social isolation (46%) were the most frequently reported consequences of hearing loss among elderly participants.

Table 5: Association Between Age and Degree of Hearing Handicap

Age Group	Mean HHIE-S Score (Mean $\pm$ SD)	Significant Handicap n (%)	p-value
60–70 years	12.4 $\pm$ 4.2	5 (11.1)	
71–80 years	18.6 $\pm$ 5.1	10 (28.6)	
>80 years	24.2 $\pm$ 6.4	9 (45.0)	0.008

Observation:

Mean HHIE-S scores increased significantly with advancing age, indicating worsening perceived hearing handicap among older participants ($p = 0.008$).

DISCUSSION

The assessment of QoL is multidimensional, encompassing physical, material, social, and emotional well-being. Our findings, supported by existing literature, indicate that hearing loss is a primary driver of reduced communicative relationships and social interactions. Interestingly, only 39% of subjects with hearing loss perceive an excellent global QoL, a stark contrast to the 68% observed in those without hearing impairment.

The HHIE-S proved to be a reliable and easy-to-use tool for identifying the emotional and social adjustment of elderly patients. Many elderly individuals employ maladaptive communication strategies, such as withdrawal or bluffing, which further reduces self-esteem and creates a cycle of social isolation. Furthermore, some patients are hesitant to seek medical help because they are afraid to acknowledge the hearing loss as a problem.

Rehabilitation and Intervention

The evidence strongly supports the use of hearing aids to mitigate these negative effects. Rehabilitation has been shown to reduce both emotional and social consequences, with users experiencing less anxiety and depression. Large-scale studies indicate that hearing aids improve both generic (e.g., SF-36) and hearing-specific QoL domains. From a public health perspective, returning hearing-impaired individuals to an ordinary lifestyle through prosthesis is considered a **cost-effective** strategy.

Strengths of the Study

This study provides valuable insights into the impact of age-related hearing loss on the quality of life among elderly individuals attending a tertiary care hospital. The use of the validated Hearing Handicap Inventory for the Elderly–Screening (HHIE-S) questionnaire ensured a standardized assessment of perceived hearing handicap. The study included participants from both ENT and Geriatric Outpatient Departments, thereby improving the clinical applicability of the

findings. Furthermore, the assessment of emotional, social, and functional consequences of hearing loss provides useful evidence to support early screening and rehabilitation strategies in geriatric healthcare.

Limitations of the Study

The study has certain limitations. First, it was conducted at a single tertiary care center with a relatively small sample size, which may limit the generalizability of the findings. Second, the cross-sectional design does not permit the establishment of causal relationships between hearing loss and quality of life. Third, hearing handicap was assessed using a self-reported questionnaire, which may be influenced by recall and response bias. Finally, objective audiometric findings were not correlated with HHIE-S scores, and long-term follow-up was not performed.

Clinical Implications

Routine hearing screening should be incorporated into geriatric health services for early identification and rehabilitation.

Future Recommendations

Multicenter prospective studies with larger sample sizes and long-term follow-up are recommended.

CONCLUSION

Presbycusis is a complex, progressive condition influenced by genetic and environmental factors that significantly impacts the independence and well-being of the elderly. This study highlights that a substantial proportion of the elderly population suffers from a perceived hearing handicap that diminishes their quality of life.

It is recommended that primary care physicians routinely test for hearing impairment in adults and refer them to audiological centers. Improving methods to identify deteriorating QoL and increasing access to assistive listening devices and coping strategies are essential steps to support the aging population. Early identification and timely rehabilitation of hearing loss should be integrated into routine geriatric healthcare to improve quality of life and healthy ageing.

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Conflict of Interest

The authors declare that they have no conflicts of interest related to this study.

Author Contributions

Dr. Della: Conceptualization, study design, data collection, manuscript preparation, and literature review.

Dr. S. Rakshitha: Clinical evaluation, patient recruitment, data interpretation, manuscript review, and critical revision.

Dr. Pavankumar Patted: Study supervision, methodology, statistical analysis, interpretation of results, manuscript editing, and final approval of the manuscript.

All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request. Participant confidentiality has been maintained in accordance with institutional ethical guidelines.

Abbreviations

Abbreviation	Full Form
HHIE-S	Hearing Handicap Inventory for the Elderly–Screening
QoL	Quality of Life
ENT	Ear, Nose and Throat
OPD	Outpatient Department
IEC	Institutional Ethics Committee
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
CI	Confidence Interval
WHO	World Health Organization

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