JSLA LINK JOURNAL OF SPEECH, LANGUAGE AND AUDIOLOGY

https://doi.org/10.61919/ljsla.v4i1.38

Original Article

Prevalence And Severity of Hearing Loss in Adults Aged 55 or Above

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Cite This Article

Ayesha Masood Rana et al. 2026. Prevalence And Severity of Hearing Loss in Adults Aged 55 or Above. Link Journal of Speech, Language and Audiology. 4, 1 (Jun. 2026), e38. DOI:https://doi.org/10.61919/ljsla.v4i1.38.

Received: 20 January 2026; **Accepted**: 27 May 2026; **Published**: 30 June 2026.

Author Contributions: Concept: AMR, SM; Design: FM, HFR; Data Collection: YW, KA; Analysis: HM, US; Drafting: SM, FM, HM.

Ethical Approval: No. FMH-01/09/2025-IRB-1000 FMH Institute of Allied Health Sciences, Lahore, Pakistan. **Informed Consent**: Written informed consent was obtained from all participants; **Conflict of Interest**: The authors declare no conflict of interest.

Funding: No external funding; **Data Availability**: Available from the corresponding author on reasonable request; **Acknowledgments**: N/A.

ABSTRACT

Background: Hearing loss in older adults has become a significant public health concern, particularly in terms of its effect on communication, quality of life, neurocognitive, and psychosocial outcomes. Objective: This study aimed to assess the prevalence and severity of hearing loss in adults aged 55 years and above in a clinical population. In addition, hearing loss was characterized by type, laterality, and some health-related factors. Methods: This was a cross-sectional study conducted from September to December 2024 in the Audiology Department of Fatima Memorial Hospital, Shadman Lahore, and a hearing clinic/audiology centre in Lahore. Pure tone audiometry was conducted on 138 adults aged 55 years and above. The participants' demographic/clinical characteristics, such as diabetes, hypertension, noise exposure, dementia, depression, and hearing aid use, were noted on a structured proforma. Hearing loss was defined as a better ear average of >25 dB. Hearing loss was characterized by severity, type, and laterality. Associations were tested by chi-square, and $p<0.05$ was considered significant. Results: The participants' mean age was 65.57±10.65 years. Among them, 77 (55.8%) were males. Hearing loss was found in 81 out of 138 participants (58.7%). Among hearing-impaired participants, 66 out of 81 were found to have sensorineural hearing loss. Moreover, 74 out of 81 participants experienced hearing loss in both ears. The severity distribution of hearing loss was mild in 12/81 (14.8%), moderate in 37/81 (45.7%), severe in 22/81 (27.2%), and profound in 10/81 (12.3%). Type of hearing loss was significantly associated with severity. Furthermore, severity was significantly associated with diabetes mellitus and hypertension. Hearing aid/assistive device use was reported in 31/138 (22.5%). Conclusion: Hearing loss in this study was found to be highly prevalent among adults aged ≥55 years, predominantly bilateral sensorineural hearing loss of moderate to severe degree, with poor utilization of rehabilitation options. Routine screening for hearing loss among this age group would be beneficial.

Keywords:
Prevalence, hearing loss, adults aged ≥55 years, pure tone audiometry, sensorineural hearing loss, hypertension, diabetes mellitus, hearing aids.

INTRODUCTION

Hearing plays a vital role in the effective communication and social interaction of individuals. Age-related hearing loss is considered a significant public health problem among the aged. The human auditory system has the complex task of transducing sound vibrations into neural signals that are interpreted in the brain. This process involves the outer ear, middle ear, inner ear, and the neural pathways. Sound waves picked up by the outer ear are conducted to the eardrum and then to the ossicles. This sound then causes hair cells in the inner ear to produce nerve impulses that travel to the brain via the vestibulocochlear nerve. Hearing loss may occur due to damage to any of these structures. Hearing loss may be conductive, sensorineural, or mixed (1,2).

Population aging has further emphasized the impact of hearing loss, which is affecting people worldwide. Elderly people are facing an increase in both the prevalence and severity of hearing loss, which is attributed to cochlear cell loss, vascular and metabolic factors, disease burden, noise, and ototoxicity. A substantial body of epidemiologic evidence shows that there is a marked increase in the prevalence of hearing loss with age, with a high prevalence in older age groups, and it is one of the leading causes of disability and participation restriction (3). Similar evidence from various settings worldwide shows a high prevalence of hearing loss in people aged 50-60 years and above, with sensorineural hearing loss being the most common cause, and the severity of hearing loss is known to increase with age (4-7). Apart from disability in communication and participation, hearing loss is also known to cause other serious health issues, such as depression, dementia, and cognitive decline, and hearing rehabilitation is known to reduce negative cognitive outcomes (8_10).

This condition is often underdiagnosed and undertreated, and the use of hearing aids is low even in individuals with significant hearing loss (3,7). In the local population of Pakistan, there is limited evidence regarding the prevalence, severity distribution, and types of hearing loss, as well as laterality and treatment, in the population aged ≥55 years, and the data may not be applicable to the local population due to differences in population demographics, environmental factors, and disease patterns. The aim of the current study is to determine the prevalence and severity of hearing loss in the local population aged ≥55 years, to describe the types and laterality of hearing loss, and to investigate the association of severity of hearing loss with certain health-related factors.

RESULTS:

The cohort (n=138) had a mean age of 65.57±10.65 years (55–93) with a male predominance (55.8%).

Table 1. Distribution of gender and Health-Related Characteristics (n = 138)

Variable	Yes n (%)	No n (%)
Male	77	55.8
Female	61	44.2
Hypertension	50 (36.2)	88 (63.8)
Diabetes mellitus	33 (23.9)	105 (76.1)
Noise exposure	6 (4.3)	132 (95.7)
Dementia	18 (13.0)	120 (87.0)
Depression	14 (10.1)	124 (89.9)

Diabetes and hypertension were present in 23.9% and 36.2%, respectively, while reported noise exposure was uncommon (4.3%). Dementia (13.0%) and depression (10.1%) were reported in a minority of participants. Hearing aid/assistive device use was reported by 22.5%, indicating limited rehabilitation uptake at the sample level.

Table 2. Prevalence, Type, Laterality, and Severity of Hearing Loss

Domain	Category	n	%
Hearing status (n=138)	Hearing loss present	81	58.7
	Normal hearing	57	41.3
Type among hearing loss (n=81)	Conductive (CHL)	4	4.9
	Sensorineural (SNHL)	66	81.5
	Mixed (MHL)	11	13.6

Laterality among hearing loss (n=81)	Unilateral	7	8.6
	Bilateral	74	91.4
Severity among hearing loss (n=81)	Mild	12	14.8
	Moderate	37	45.7
	Severe	22	27.2
	Profound	10	12.3

Hearing loss was found in 81/138 participants, with a prevalence rate of 58.7%. In addition, 41.3% of the participants were found to have normal hearing levels. Among the hearing-impaired participants, SNHL was the most common type of hearing loss, with a prevalence rate of 81.5%. MHL and CHL were less common, with 13.6% and 4.9%, respectively. Bilateral hearing loss was the most common, with a prevalence rate of 91.4%, while 8.6% of the participants were found to have unilateral hearing loss.

Table 3. Associations with Degree of Hearing Loss (n=81)

Type of Hearing Loss vs Degree	Type	Mild	Moderate	Severe	Profound	p-value
	CHL	0	4	0	0	<0.001
	SNHL	8	29	19	10	
	MHL	4	4	3	0	
Diabetes vs Degree	Yes	8	14	8	3	<0.001
	No	4	23	14	7	
Hypertension vs Degree	Yes	10	23	12	5	<0.001
	No	2	14	10	5	

A statistically significant association was found between the type of hearing loss and its degree ($p<0.001$), where moderate to profound hearing loss was found to be predominant in sensorineural hearing loss. Severity was significantly associated with diabetes mellitus ($p<0.001$), where diabetic patients had a higher proportion of mild and severe to profound hearing loss compared to non-diabetic patients. Hypertension was significantly associated with the degree of hearing loss ($p<0.001$), where patients with hypertension had a higher proportion of mild, moderate, and severe hearing loss.

MATERIALS AND METHODS

The current cross-sectional observational study was carried out from September 2024 to December 2024 in the Audiology Department of Fatima Memorial Hospital, Shadman, Lahore, and a Hearing Clinic and Audiology Centre in Lahore. Adults aged 55 years or older, with or without hearing loss, were included in this study, while people with less than 55 years of age were excluded from this study. A non-probability, convenient sampling technique was applied to recruit participants from the study sites during the data collection period. Verbal informed consent was obtained from the study participants before data collection, and confidentiality of data was maintained.

In this study, a self-designed, structured proforma was applied to collect data from the study participants, and hearing status was measured by pure tone audiometry. Pure tone average was measured by taking hearing thresholds in the frequency range of 250-8000 Hz. Degree of hearing loss was calculated by taking better ear pure tone average of hearing thresholds in 500, 1000, 2000, and 4000 Hz. Hearing loss was defined as a pure tone average of more than 25 dB, and further categorized into mild (26-40 dB), moderate (41-70 dB), severe (71-90 dB), and profound (>91 dB). Hearing loss was classified into conductive, sensorineural, and mixed based on audiogram configuration, and unilateral and bilateral based on laterality of hearing loss.

Sample size was calculated by applying a single proportion formula with a given proportion of 0.10, confidence level of 95%, and 5% margin of error, and sample size was found to be 138. IBM SPSS version 25 was applied to analyze data, and categorical variables were expressed in the form of numbers and percentages, and continuous variables in the form of mean and standard deviation. Chi-square test was applied to check associations between categorical variables such as degree with type, diabetes, and hypertension, and p-value less than 0.05 was considered statistically significant.

DISCUSSION

This study has shown that hearing loss is a common condition among adults aged 55 years and older in a local clinical population, with a prevalence of 58.7%. This finding is consistent with international evidence indicating a high prevalence of hearing loss among older adults and a trend towards increasing prevalence with increasing age (3–5). The high prevalence of sensorineural hearing loss (81.5%) and the high proportion of bilateral hearing loss (91.4%) are consistent with the pattern of cochlear and neural degeneration with increasing age (4–7). The pattern of hearing loss severity with moderate loss being the most common category is consistent with the pattern of hearing loss severity reported in epidemiologic studies, with moderate-to-severe hearing loss making a major proportion of hearing loss among older adults (3,7).

The association of hearing loss type and severity indicates that the clinically significant hearing loss in this population was mainly due to sensorineural loss rather than conductive loss. The association of the severity of hearing loss with diabetes and hypertension indicates that metabolic and vascular factors may contribute to cochlear microvascular damage and hearing loss (5,8). This study supports the importance of a combined approach to managing chronic diseases and hearing loss among older adults.

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Notably, despite the high prevalence of hearing impairment, the use of hearing aids or assistive devices in the general sample was only 22.5%. This has significant implications in the treatment of hearing loss, as previous studies have also shown that even in cases of high prevalence of hearing loss, the use of hearing aids has been found to be low in other studies conducted in regions where the prevalence of hearing loss has been found to be high (3,7). Furthermore, longitudinal studies have also shown that hearing loss has significant implications in the development of dementia, and the use of hearing aids has been found to reduce this risk (9,10).

Limitations of the study include the fact that convenience sampling may have been conducted in this study. Moreover, history-based reporting may have been conducted in this study. However, this study has provided significant implications in understanding the high prevalence of hearing loss in the local community, where adults aged ≥55 years have a high burden of hearing loss due to predominantly bilateral sensorineural hearing loss. Moreover, the use of hearing aids has been found to be low in this sample.

CONCLUSION

Hearing loss has been found to be highly prevalent in adults aged 55 years and above. In this study, it has been found that the hearing loss in this sample has been predominantly sensorineural and bilateral. Moreover, the severity of hearing loss has been found to be significant in the presence of diabetes mellitus and hypertension.

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