



Original Article

Prevalence of Hearing Aids Usage and Their Outcomes in Old Age Population

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ABSTRACT

Hearing loss caused by old age or presbycusis is the type that occurs gradually as people age. Many people cover up their handicap by wearing hearing aids. Some sounds are amplified by hearing aids so that people with hearing loss can listen, converse, and engage in more everyday activities. **Objective:** To determine the prevalence of hearing aids usage and the outcomes of hearing aids in old age population. **Methods:** Cross Sectional observational study was conducted to find the prevalence of usage and outcomes of hearing aids in old age population on a sample of 161 patients with both male and female with non-probability purposive sampling technique. The research was carried out in one hospital (University of Lahore Teaching Hospital). Duration of this study was 6 months from Jan 2023 to June 2023. Patients 50 years of age and older were included. Patients with other comorbid factors like congenital anomalies, conductive hearing loss were excluded. The data were gathered using a self-structured questionnaire. Data were analyzed through (SPSS) version 27.0 package. **Results:** Out of 161 patients, 86 (53.4%) of the participants were men, and 75 (46.6%) were women. Only 57 of them (35.4%) used hearing aids; 52 (91.2%) individuals got benefit from hearing aids in daily activities; and 51 (89.5%) individuals were confident that using hearing aids would compensate their disability. **Conclusions:** This study found that among hearing aid users, the majority of participants got benefit from their hearing aids.

INTRODUCTION

The term "Hearing impairment" refers to a broad range of reductions in hearing abilities ranging from subjectively barely perceptible impairment to complete hearing loss. Decrease sound conduction to the labyrinth, the ability of the cochlea to perceive sound, the cochlear nerve, and central auditory pathways all contribute to hearing loss. Therefore, hearing loss is a symptom of various diseases that affect the hearing organ. Noise, aging, illness, and genetics can all contribute to hearing impairment [1]. Hearing loss types are as follows. Conductive hearing loss, which affects the outer or middle ear, sensorineural hearing loss, which affects the inner ear, and mixed hearing loss, which mixes conductivity and sensorineural hearing

loss [2]. Any defect in the pinna, external auditory canal, tympanic membrane, ossicles, or stapes footplate can cause conductive hearing loss [3]. Otitis externa, tympanic membrane perforation, acute and chronic otitis media, ossicular disruption or fixation, and otosclerosis are a few common causes. Conductive hearing loss is mild to moderate in severity, and the majority of causes can be treated medically [4]. The most frequent form of hearing loss is sensorineural (SNHL). Hearing loss from cochlear, auditory nerve, or central nervous system disorders is referred to as SNHL. Congenital, presbycusis, noise-induced hearing loss, head injury, meniere's disease, ototoxicity, meningitis, diabetes, vestibular schwannoma

and perilymphatic fistula are the most typical causes of sensorineural hearing loss [5]. The most prevalent sensory loss in advanced societies is SNHL. Congenital SNHL is nearly three times more common in the USA than Down's syndrome [6]. Presbycusis is a term for bilateral hearing loss brought on by aging. It literally translates to "old hearing." It starts to show at age 60 and progresses gradually [7]. If a person has age-related hearing loss, they may find it difficult to endure loud noises or hear what others are saying. Hearing high-pitched stimuli, such as a phone ringing or a microwave blaring, is the most frequent disability. Adult hearing loss frequently manifests as concerns made to a professional by close family members or as the patient becoming reclusive and socially isolated, which motivates the family to seek treatment. According to estimates, 28 million adults in the US suffer from hearing loss [8]. Researches show that 25.1% population of ages 55 to 64 and 42.7% of ages 65 to 85 are affected by hearing loss in the US [9]. Furthermore, age-related hearing loss affects more than 40% of those over the age of 50 and up to about 71% of those over the age of 70. This is a somewhat unnoticeable aspect of aging for the majority of people [10]. And the prevalence of hearing loss among many individuals of age 60 and older is 58.85% [11]. The disadvantages brought on by hearing loss are somewhat overcome with hearing aids. In order to make up for the loss, hearing aids must enhance weak sounds more so than powerful noises. Even when using hearing aids, people with SNHL need a higher signal-to-noise ratio than usual in order to successfully converse. Contrarily, a problem with sound conduction simply causes the sound to be less loud as it travels through the middle ear, so the gain offered by hearing aids comes close to restoring normal hearing. Hearing aids are described based on where they are worn. These categories are body, spectacle, behind-the-ear, in-the-ear, in-the-canal, and completely-in-the-canal, in decreasing order of size [12]. Only 15% to 20% of Americans over the age of 70 wear hearing aids, despite the fact that two thirds of the population has hearing loss. The severity of hearing loss is classified as mild (26–40 dB HL), moderate (41–60 dB HL), severe (61–80 dB HL), or profound (>80 dB HL) [13]. Socioeconomic characteristics have a significant impact on how often older persons use hearing aids, which results in inequalities in access and adoption. Comparatively to those from lower socioeconomic origins, people from higher socioeconomic classes are more likely to use hearing aids [14]. Despite having hearing loss that profoundly affects their everyday lives, those with lower incomes are frequently less likely to use hearing aids due to their high cost. Senior citizens in lower socioeconomic categories may experience a decreased quality of life as a result of this imbalance [15]. Higher socioeconomic status

elderly persons are more likely to use hearing aids. Higher-income individuals are more likely to seek out and receive proper hearing aid fittings because they frequently have better access to healthcare services, including audiologists and hearing healthcare experts [16]. Very limited data are available regarding it to focus on prevalence of hearing aids usage and their outcomes in old age population in developing countries like Pakistan.

METHODS

Cross-sectional observational study was conducted to find the prevalence of hearing aids usage and their outcomes in old age population. The study was performed at University of Lahore Teaching Hospital. Duration of study was 6 months (January 2023 to June 2023). There was sample size of 161 old adults which was calculated through online calculator. Sample size was calculated on the basis of prevalence of hearing aids users 12.57% by using 95% confidence level and 5% confidence interval [17]. Non-probability purposive sampling technique was used for data collection. Male and Female of age 50 years and older were included. Patients with conductive hearing loss, congenital anomalies and other co-morbidities were excluded from this research. Self-structured questionnaire was used to accumulate the data. Researcher guided the patients and took the written consent from the patients; the questionnaire was filled by the patients. With the help of questionnaire, the outcomes of hearing aids in old age population were assessed. The results were compared between the groups. Data were analyzed through SPSS version 27.0 package.

RESULTS

Table 1 shows that out of 161 old adults, patients within the age group of 50 to 60 years were 65 (40.4%) and above 61 years of age were 96 (59.6%). Patients belonging to lower socioeconomic class were 26 (16.1%), middle class were 78 (48.4%) and upper class were 57 (35.4%). Patients of male gender were 86 (53.4%) and female were 75 (46.6%).

Table 1: Demographics

Variables	Sub Variables	Frequency (%)
Age	50-60	65 (40.4)
	61 and above	96 (59.6)
Socioeconomic Class	Lower	26 (16.1)
	Middle	78 (48.4)
	Upper	57 (35.4)
Gender	Male	86 (53.4)
	Female	75 (46.6)

Table 2 shows that out of 161 old adults with hearing loss, 57 (35.4%) were hearing aid users and non-hearing aid users were 104 (64.6%). Out of 57 hearing aid users, 22 (38.6%) patients reported outer ear infections because of hearing aid usage. Patients who benefit from hearing aid in their

daily activities were 52 (91.2%). 51 (89.5%) patients said that their hearing aid helps them in their workplace. Hearing aid has helped 44 (77.2%) individuals to interact socially. 51 (89.5%) individuals were confident that using hearing aid would make up for their disability. 43 (75.4%) individuals reported that their self-confidence has improved after wearing hearing aids. People who were confident that purchasing hearing aids is the right decision for them were 48 (84.2%) and 37 (64.9%) patients were satisfied with the hearing aid cost.

Table 2: Response of participants

Variables	Yes	No
	Frequency (%)	Frequency (%)
Are you a Hearing Aid user?	57 (35.4)	104 (64.6)
Has the hearing aid caused any outer ear infection?	22 (38.6)	35 (61.4)
Do your hearing aids have benefited you in your daily activities?	52 (91.2)	5 (8.8)
Does your hearing aid help in your workplace?	51 (89.5)	6 (10.5)
Do you believe that having hearing aid helped you to interact socially?	44 (77.2)	13 (22.8)
Do you believe that wearing hearing aids will make up for your disability?	51 (89.5)	6 (10.5)
Has your self-confidence improved now that you are wearing aids?	43 (75.4)	14 (24.6)
Are you certain that purchasing hearing aids was the right decision for you?	48 (84.2)	9 (15.8)
Does the cost of the hearing aid seem reasonable to you?	37 (64.9)	20 (35.1)

DISCUSSION

The findings of this study indicate that, of the 161 elderly people who participated in the sample population and had hearing loss, 57 (35.4%) utilized hearing aids whereas 104 (64.6%) did not use hearing aids despite having hearing impairment. The results of a study conducted by Polat et al., in 2022 indicated that from the total participants (3126) of the study, 84.48% of all individuals needed a hearing aid and only 12.57% of the participants in the study who need a hearing aid actually used one, though. The prevalence of hearing aid usage among the elderly was found to be extremely low [18]. According to the study's findings, out of 57 hearing aid users, 35 (61.4%) said that using hearing aids had not caused an outer ear infection, while 22 (38.6%) said that using hearing aids had caused an ear infection, particularly in the auditory meatus or outer ear canal, such as otitis external, blockage of earwax, and furuncle. Seidel et al., conducted research in 2019, which concludes that 20,127 individuals with hearing aid recommendations and controls were compared. When comparing HA and controls, the highest twelve-month occurrences were seen for "earwax blockage" (H61.2) (16.5% vs. 4.2%),

"Unidentified otitis externa" (H60.9) (2.6% vs. 1.2%), and "Acute noninfectious otitis externa" (H60.5) (2.3% vs. 0.7%). The conditions with the highest risk increases for individuals who used hearing aids were "Furuncle of the outer ear" (H60.0, OR 10.03), "Other otitis externa" (H60.8, OR 6.00), and "wax blockage" (H61.2, OR 4.55) [19]. According to the study's findings, 20 (35.1%) of the 57 hearing aid users in the older population were dissatisfied with the price of their current devices, while 37 (64.9%) of them were satisfied with the cost of their hearing aids. Research done by Jilla et al., in 2020 with the purpose of hearing aids affordability in the United States of America concludes that three-fourths of Americans with functional hearing loss could not afford hearing aids, and hundreds of thousands of people would become impoverished if they did. Many Americans with hearing loss would no longer struggle with affordability if out-of-pocket hearing device fees were reduced to \$500 or \$1000 [20]. The study's findings indicate that, among the 57 hearing aid users in the older population, 52 (91.2%) people profit from them in their everyday activities, whereas 5 (8.8%) of the population did not. Results of a study conducted by Polat et al., in 2022 show that without hearing aids, the best SRT and SDS values were determined to be 58.6 dB HL and 61.1%, respectively. With hearing aids, these values increased to 39 dB HL and 74.6%. For each group, a statistically significant difference was seen between the SRT and SDS values with and without the use of hearing aids [18].

CONCLUSIONS

The results of this study conclude that the majority of the participants benefit from hearing aids, especially in their workplaces. Hearing aids have helped users interact socially, and users' self-confidence has also improved after wearing hearing aids. As a result, it is preferable for the geriatric population the programs for hearing screening, testing and rehabilitation should be developed. Through media and television, awareness campaigns about the hearing loss challenges and benefits of utilizing hearing aids should be beneficial.

Authors Contribution

Conceptualization: MBRK
 Methodology: FT, FK, MA²
 Formal analysis: SAB, MA¹, DA
 Writing-review and editing: MBRK, NA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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