

# Comparison of Knowledge About Hearing Aids Among Patients with Hearing Impairment

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## ABSTRACT

**Background:** Effective hearing-aid use depends on practical device knowledge, appropriate maintenance, realistic expectations, and psychosocial acceptance. **Objective:** To compare hearing-aid-related responses among new and experienced users with hearing impairment. **Methods:** This analytical cross-sectional study included 160 adults recruited through purposive sampling from the University of Lahore Teaching Hospital and Alam Audiology Clinic. Participants were divided equally into new and experienced hearing-aid-user groups. A structured questionnaire assessed equipment care, decision-making and social influence, and the fitting and follow-up process. Group responses were compared using the Mann–Whitney U test. **Results:** Men comprised 60.0% of participants, 65.6% used behind-the-ear devices, and 86.3% had sensorineural hearing loss. Experienced users had higher response ranks for personal initiation of hearing-aid use (106.00 versus 55.00,  $p<0.001$ ) and knowing another hearing-aid user (85.50 versus 75.50,  $p=0.033$ ). New users had higher ranks for the anti-fall protection item (94.25 versus 66.75,  $p<0.001$ ) and embarrassment about public use (87.06 versus 73.94,  $p=0.019$ ). Most fitting and follow-up items did not differ significantly. **Conclusion:** Differences between new and experienced users were domain-specific rather than evidence of a consistent overall knowledge advantage. Continuing counselling should address device care, expectations, decision-making, social influences, and stigma. **Keywords:** Hearing aid; hearing impairment; device knowledge; hearing rehabilitation; experienced users; counselling.

## INTRODUCTION

Hearing loss can adversely affect communication, social participation, personal safety, emotional well-being, and health-related quality of life. Hearing aids are among the most frequently used rehabilitation options for adults with hearing impairment; however, obtaining a hearing aid does not necessarily lead to consistent or effective use. Hearing-aid adoption and continued use are influenced by perceived communication difficulties, expectations of benefit, attitudes towards amplification, financial and practical barriers, and previous engagement with hearing-care services (1–4).

Successful hearing-aid use also requires practical knowledge of device handling and maintenance. Users must understand appropriate battery management, prevention and removal of wax accumulation, protection from heat and moisture, care of the earmould, correct device placement, and the importance of follow-up assessment and adjustment. These tasks can remain challenging even for individuals with previous hearing-aid experience. Considerable variation in practical hearing-aid skills has been reported among experienced users, indicating that duration of use alone may not ensure correct device management (5). Hearing-aid self-care is also influenced by the quality of initial instruction, confidence

in handling the device, physical dexterity, and access to continuing counselling and technical support (6).

New hearing-aid users may face additional challenges while adapting to amplified sound, developing daily-use routines, learning device care, and forming realistic expectations regarding benefit. Difficulties encountered during the early months following hearing-aid fitting may reduce use and satisfaction if they are not addressed through structured follow-up and individualized counselling (7). Educational interventions developed for first-time users can improve access to practical information and reinforce the skills taught during hearing-aid fitting (8). Nevertheless, both first-time and experienced users may require continuing assistance because experience does not uniformly translate into better handling skills, knowledge, or treatment outcomes (9).

Hearing-aid use is also influenced by factors extending beyond technical knowledge. Personal initiative, familiarity with other hearing-aid users, perceived satisfaction among peers, and embarrassment associated with wearing a visible device may affect an individual's willingness to obtain and use amplification. These psychosocial and social influences should be distinguished from factual knowledge because they represent related but conceptually different aspects of hearing rehabilitation (3,4,10). Comparing these dimensions between users at different stages of hearing-aid experience may help clinicians identify persistent misconceptions and determine whether counselling should be adapted according to previous device use.

Evidence directly comparing the hearing-aid-related knowledge, attitudes, and reported practices of new and experienced users remains limited in the participating clinical settings. The present study therefore aimed to compare new and experienced hearing-aid users with hearing impairment across three domains: equipment care, decision-making and social influences related to hearing-aid use, and knowledge of the hearing-aid fitting and follow-up process.

## MATERIALS AND METHODS

This analytical cross-sectional study was conducted at the University of Lahore Teaching Hospital and Alam Audiology Clinic. The target population consisted of adults with hearing impairment who were using hearing aids. Participants were recruited using a non-probability purposive sampling technique and were enrolled into two equal comparison groups comprising 80 new hearing-aid users and 80 experienced hearing-aid users.

The sample size was calculated for estimation of a single population proportion. An expected satisfaction proportion of 82% among new hearing-aid users, a 90% confidence level, and an absolute precision of 5% produced a required sample of approximately 160 participants. The final sample therefore included 160 hearing-aid users.

Men and women aged 18 years or older were eligible if they were new or experienced users of analogue or digital hearing aids. Individuals with monaural or binaural hearing-aid fittings and different types of hearing loss were eligible for participation. Participants who had another family member with hearing impairment were excluded in accordance with the original study eligibility criteria.

Data were collected using a demographic information form and a structured hearing-aid questionnaire. The demographic form was developed with expert input and recorded age, sex, educational level, socioeconomic status, type of hearing-aid fitting, type of hearing aid, and type of hearing loss. The hearing-aid questionnaire was adapted from the instrument described by de Costa Ferreira and Sant'Anna (11) and was used to examine item-level responses across three domains.

The equipment-care domain assessed whether users understood the need to remove the battery when the hearing aid was not in use, the effect of wax accumulation on device functioning, the appropriateness of storing a hearing aid in hot or moist environments, and whether hearing aids contain an anti-fall

protection mechanism. The decision-making and social-influence domain assessed whether the decision to use a hearing aid was initiated by the participant, whether the participant knew another person who used a hearing aid, and whether that person was perceived to be satisfied with the device.

The hearing-aid fitting and follow-up domain assessed participants' understanding of device use during the first week, lending or donating a hearing aid without individual examination and adjustment, embarrassment associated with wearing a hearing aid in public, the need to remake the earmould, the importance of returning to the hearing centre after purchasing the device, and the involvement of a family member during hearing-aid guidance. The same questionnaire domains were assessed in both comparison groups, and the analysis was conducted at the individual-item level rather than by combining the items into a single overall knowledge score.

Categorical demographic characteristics were summarized using frequencies and percentages. Responses from new and experienced hearing-aid users were compared using the Mann–Whitney U test, and the number of participants and mean rank for each group were reported. Statistical testing was performed using two-sided tests, and a p-value below 0.05 was considered statistically significant. Because the study used a cross-sectional design, the findings were interpreted as differences between user groups rather than as evidence that previous hearing-aid use caused changes in knowledge, attitudes, or reported practices.

## RESULTS

A total of 160 hearing-aid users were included, comprising 80 new users and 80 experienced users. The largest age group was 18–28 years, accounting for 56 participants (35.0%), followed by participants aged 29–38 years (18.8%) and 39–48 years (17.5%). Men represented 60.0% of the sample, and 57.5% of participants had attained higher education. Most participants belonged to the middle socioeconomic group (66.3%).

*Table 1. Sociodemographic and Clinical Characteristics of the Participants (N=160)*

| Characteristic       | Category            | n   | %    |
|----------------------|---------------------|-----|------|
| Age group, years     | 18–28               | 56  | 35.0 |
|                      | 29–38               | 30  | 18.8 |
|                      | 39–48               | 28  | 17.5 |
|                      | 49–58               | 21  | 13.1 |
|                      | 59–68               | 8   | 5.0  |
|                      | 69–78               | 9   | 5.6  |
|                      | 79–88               | 7   | 4.4  |
|                      | >88                 | 1   | 0.6  |
| Sex                  | Male                | 96  | 60.0 |
|                      | Female              | 64  | 40.0 |
| Educational level    | No formal education | 5   | 3.1  |
|                      | Matriculation       | 28  | 17.5 |
|                      | Intermediate        | 35  | 21.9 |
|                      | Higher education    | 92  | 57.5 |
| Socioeconomic status | Low                 | 32  | 20.0 |
|                      | Middle              | 106 | 66.3 |
|                      | Upper               | 22  | 13.8 |
| Hearing-aid fitting  | Monaural            | 97  | 60.6 |
|                      | Binaural            | 63  | 39.4 |
| Hearing-aid type     | Behind-the-ear      | 105 | 65.6 |
|                      | Completely-in-canal | 36  | 22.5 |
|                      | In-the-canal        | 17  | 10.6 |
|                      | In-the-ear          | 2   | 1.3  |
| Type of hearing loss | Conductive          | 3   | 1.9  |
|                      | Sensorineural       | 138 | 86.3 |
|                      | Mixed               | 19  | 11.9 |

Monaural hearing-aid fitting was more common than binaural fitting, accounting for 97 participants (60.6%). Behind-the-ear hearing aids were the most frequently used devices (65.6%), followed by completely-in-canal devices (22.5%). Sensorineural hearing loss was reported in 138 participants (86.3%), while mixed and conductive hearing loss accounted for 11.9% and 1.9%, respectively.

*Table 2. Mean Ranks for Hearing-Aid-Related Questionnaire Items Among New and Experienced Users*

| Domain and questionnaire item                                                    | New users, n | Mean rank | Experienced users, n | Mean rank |
|----------------------------------------------------------------------------------|--------------|-----------|----------------------|-----------|
| <b>Equipment care</b>                                                            |              |           |                      |           |
| Battery should be removed when the hearing aid is not in use                     | 80           | 74.99     | 80                   | 86.01     |
| Wax accumulation interferes with hearing-aid use                                 | 80           | 81.78     | 80                   | 79.22     |
| Hearing aids may be stored in hot or moist places                                | 80           | 86.00     | 80                   | 75.00     |
| Hearing aids have an anti-fall protection mechanism                              | 80           | 94.25     | 80                   | 66.75     |
| <b>Decision-making and social influence</b>                                      |              |           |                      |           |
| Decision to use the hearing aid was initiated by the participant                 | 80           | 55.00     | 80                   | 106.00    |
| Participant knows another person who uses a hearing aid                          | 80           | 75.50     | 80                   | 85.50     |
| The known hearing-aid user is satisfied with the device                          | 80           | 84.08     | 80                   | 76.92     |
| <b>Fitting and follow-up process</b>                                             |              |           |                      |           |
| Hearing aid should be used throughout the day during the first week              | 80           | 78.23     | 80                   | 82.77     |
| Hearing aid may be lent or donated without individual examination and adjustment | 80           | 80.79     | 80                   | 80.21     |
| Participant would feel embarrassed to use a hearing aid in public                | 80           | 87.06     | 80                   | 73.94     |
| Earmould should be remade annually                                               | 80           | 85.74     | 80                   | 75.26     |
| User should return to the hearing centre after purchasing the hearing aid        | 80           | 84.19     | 80                   | 76.81     |

The experienced-user mean rank for returning to the hearing centre was derived from the total rank sum for two equally sized groups of 80 participants.

*Table 3. Inferential Comparison of Questionnaire Responses Between New and Experienced Hearing-Aid Users*

| Questionnaire item                                        | New-user mean rank | Experienced-user mean rank | p-value |
|-----------------------------------------------------------|--------------------|----------------------------|---------|
| Battery removal when the hearing aid is not in use        | 74.99              | 86.01                      | 0.051   |
| Anti-fall protection mechanism                            | 94.25              | 66.75                      | <0.001  |
| Participant initiated the decision to use the hearing aid | 55.00              | 106.00                     | <0.001  |
| Participant knows another hearing-aid user                | 75.50              | 85.50                      | 0.033   |
| Known hearing-aid user is satisfied                       | 84.08              | 76.92                      | 0.144   |
| All-day use during the first week                         | 78.23              | 82.77                      | 0.480   |
| Lending or donating without examination and adjustment    | 80.79              | 80.21                      | 0.890   |
| Embarrassment when using a hearing aid in public          | 87.06              | 73.94                      | 0.019   |
| Annual remaking of the earmould                           | 85.74              | 75.26                      | 0.100   |
| Return to the hearing centre after purchase               | 84.19              | 76.81                      | 0.250   |

p-values were obtained using the Mann–Whitney U test. A two-sided p-value <0.05 was considered statistically significant.

Within the equipment-care domain, experienced users had a higher mean rank than new users for removing the battery when the hearing aid was not in use; however, the difference did not reach the prespecified level of statistical significance (86.01 versus 74.99,  $p=0.051$ ). A marked difference was identified for the item concerning an anti-fall protection mechanism, for which new users had a higher response rank than experienced users (94.25 versus 66.75,  $p<0.001$ ). Mean ranks were similar between the groups for the wax-accumulation item, whereas new users had a higher mean rank for the hot and moist storage item.

In the decision-making and social-influence domain, experienced users had a substantially higher mean rank for personal initiation of hearing-aid use than new users (106.00 versus 55.00,  $p<0.001$ ). Experienced users also had a higher mean rank for knowing another person who used a hearing aid (85.50 versus

75.50,  $p=0.033$ ). No statistically significant difference was found in perceived satisfaction among known hearing-aid users ( $p=0.144$ ).

Most fitting and follow-up items did not differ significantly between the groups. Mean ranks were comparable for all-day hearing-aid use during the first week ( $p=0.480$ ) and lending or donating a device without individual examination and adjustment ( $p=0.890$ ). The groups also did not differ significantly regarding annual remaking of the earmould ( $p=0.100$ ) or returning to the hearing centre after purchasing the hearing aid ( $p=0.250$ ). New users had a higher mean rank for embarrassment associated with wearing a hearing aid in public than experienced users (87.06 versus 73.94,  $p=0.019$ ).

## DISCUSSION

This study compared item-level responses concerning hearing-aid care, decision-making, social influence, fitting, and follow-up among new and experienced hearing-aid users. The findings did not demonstrate a uniform knowledge advantage for either group. Instead, differences were limited to selected technical and psychosocial items. Experienced users had higher response ranks for personal initiation of hearing-aid use and familiarity with another hearing-aid user, whereas new users had higher ranks for beliefs concerning anti-fall protection and embarrassment about wearing a hearing aid in public. Most fitting and follow-up items showed no statistically significant difference.

The higher response rank among experienced users for personal initiation of hearing-aid use may reflect greater familiarity with hearing difficulties, previous exposure to amplification, or increased confidence in making rehabilitation decisions. Previous evidence indicates that perceived hearing difficulty, expectations of benefit, attitudes towards amplification, and social support can influence the decision to seek hearing healthcare and adopt a hearing aid (2–4). Nevertheless, the cross-sectional design does not establish whether hearing-aid experience increased personal initiative or whether individuals with greater initial motivation were more likely to become persistent users.

Experienced users were also more likely to report knowing another person who used a hearing aid. Social networks and peer exposure can influence attitudes towards amplification by normalizing device use and providing opportunities to observe perceived benefits and practical challenges (3). Familiarity with other users may therefore contribute to hearing-aid acceptance, although the groups did not differ significantly in their perceptions of whether those users were satisfied with their devices. This finding suggests that social exposure and perceived satisfaction may represent distinct influences on hearing-aid adoption.

The substantial group difference in responses concerning an anti-fall protection mechanism indicates unequal beliefs about the technical capabilities of hearing aids. Because the questionnaire analysis was based on item-level response ranks, this difference should be interpreted as a difference in response pattern rather than direct evidence that one group possessed superior knowledge. Practical hearing-aid skills can vary considerably even among experienced users, and repeated counselling may be required to reinforce correct handling, maintenance, and realistic expectations regarding device functions (5,6).

Battery-removal responses approached but did not reach statistical significance. Experienced users nevertheless had a higher mean rank for this item, which may reflect greater exposure to daily maintenance routines. Self-care and maintenance practices are influenced not only by duration of hearing-aid use but also by the quality of initial instruction, opportunities for reinforcement, physical ability, and access to follow-up support (6). These findings support continued education for both new and experienced users rather than assuming that previous use guarantees correct device management.

New users had a higher response rank for embarrassment about using a hearing aid in public. Stigma, device visibility, concerns regarding ageing or disability, and anticipated reactions from others can discourage hearing-aid uptake and consistent use (1,4,10). Psychosocial concerns may be particularly important during the early adaptation period, when users are developing confidence and incorporating

the device into daily communication. Counselling for new users should therefore address both technical handling and emotional or social barriers to public use.

No significant group differences were observed for using the hearing aid throughout the first week, lending or donating a hearing aid without individual examination and adjustment, annual remaking of the earmould, or returning to the hearing centre after purchase. These findings indicate that experience alone may not produce substantial differences in understanding the fitting and follow-up process. Structured educational resources, individualized instruction, and continuing review may be beneficial for users at different stages of hearing-aid rehabilitation (7–9,12).

The study included equal numbers of new and experienced users and recruited participants from two clinical settings. It also examined several practical and psychosocial dimensions of hearing-aid use rather than limiting the comparison to device satisfaction. However, several limitations should be considered. The use of non-probability purposive sampling restricts generalizability, and the cross-sectional design prevents causal interpretation. Group-specific demographic and clinical characteristics were not available, so potential confounding by age, education, socioeconomic status, type of hearing loss, hearing-aid configuration, and device type could not be assessed. The questionnaire combined factual, attitudinal, behavioural, and social items, and item-level mean ranks did not constitute a validated overall knowledge score. In addition, multiple item-level comparisons increased the possibility of chance findings, while effect sizes and confidence intervals were unavailable.

Future research should use a clearly validated multidomain instrument, prespecified primary outcomes, group-specific baseline comparisons, and adjusted statistical models. Longitudinal studies could determine whether knowledge, confidence, stigma, and maintenance practices change following structured counselling and continued hearing-aid use.

## CONCLUSION

New and experienced hearing-aid users demonstrated different response patterns in selected technical and psychosocial domains, but neither group showed a consistent overall advantage. Experienced users had higher response ranks for personal initiation of hearing-aid use and familiarity with other users, while new users differed in beliefs concerning anti-fall protection and reported greater embarrassment about public hearing-aid use. Most fitting and follow-up items were comparable between the groups. These findings support continuing, individualized counselling that addresses device care, realistic expectations, decision-making, social influences, and stigma throughout the hearing-aid rehabilitation process.

## REFERENCES

1. Tahden MA, Gieseler A, Meis M, Wagener KC, Colonius H. What keeps older adults with hearing impairment from adopting hearing aids? *Trends Hear*. 2018;22:2331216518809737.
2. Manchaiah V, Beukes EW, Baguley DM, Grenness C. How and why adults with hearing loss seek hearing healthcare: a scoping review. *Int J Audiol*. 2021;60(7):455–467. doi:10.1080/14992027.2020.1842819.
3. Meyer C, Hickson L, Lovelock K. Hearing aid uptake in older adults: the role of knowledge, attitudes, and social influence. *J Am Acad Audiol*. 2020;31(5):394–403. doi:10.3766/jaaa.18073.
4. Ng JH, Loke AY. Determinants of hearing aid adoption and use among older adults: a systematic review. *Int J Audiol*. 2020;59(5):331–343. doi:10.1080/14992027.2019.1698771.
5. Desjardins JL, Doherty KA. Do experienced hearing aid users know how to use their hearing aids correctly? 2009.

6. Ng JHY, Loke AY. Determinants of hearing aid self-care and maintenance: a qualitative systematic review. *Patient Educ Couns*. 2021;104(4):759–769. doi:10.1016/j.pec.2020.10.002.
7. Solheim J, Gay C, Hickson L. Older adults' experiences and issues with hearing aids in the first six months after hearing aid fitting. *Int J Audiol*. 2018;57(1):31–39.
8. Ferguson MA, Leighton P, Brandreth M, Wharrad H. Development of a multimedia educational programme for first-time hearing aid users: a participatory design. *Int J Audiol*. 2021;60(5):347–355. doi:10.1080/14992027.2020.1833253.
9. Houmøller SS, Wolff A, Möller S, Narne VK, Narayanan SK, Godballe C, et al. Prediction of successful hearing aid treatment in first-time and experienced hearing aid users using the International Outcome Inventory for Hearing Aids. *Int J Audiol*. 2022;61(2):119–129.
10. Vas V, Akeroyd MA, Hall DA. A data-driven synthesis of research evidence for domains of hearing loss, as reported by adults with hearing loss and their communication partners. *Trends Hear*. 2017;21:1–25. doi:10.1177/2331216517734088.
11. da Costa Ferreira MID, Sant'Anna LM. Knowledge on adaptation process of users of hearing aid. 2008.
12. World Health Organization. World report on hearing. Geneva: World Health Organization; 2021. Available from: <https://www.who.int/publications/i/item/9789240020481>.