

Otolaryngologists' and residents' approaches to the management of unilateral sensorineural hearing loss: A cross-sectional survey study

Fatih Mutlu ¹, Şule Çekiç ²

¹ Kocaeli University, Faculty of Medicine, Department of Otorhinolaryngology, Kocaeli, Turkey

² Ankara Yıldırım Beyazıt University, Faculty of Health Sciences, Department of Audiology, Ankara, Turkey

ORCID  of the author(s)

FM: <https://orcid.org/0000-0003-4831-9582>
ŞÇ: <https://orcid.org/0000-0001-8174-800X>

Corresponding Author

Fatih Mutlu
Kocaeli University Medical Faculty, Department of Otorhinolaryngology, Kabaoğlu, İzmit, Kocaeli, Turkey
E-mail: drfatihmutlu@gmail.com

Ethics Committee Approval

The study was approved by the Ethical approval was obtained from the Kocaeli University Non-Interventional Clinical Research Ethics Committee, KÜ GOKAEK-2024/12.04; July 26, 2024.

All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

Conflict of Interest

No conflict of interest was declared by the authors.

Financial Disclosure

The authors declared that this study has received no financial support.

Previous Presentation

This study was previously presented as an oral presentation at the 13th Cochlear Implantation and Audiology Congress, Muğla, Turkey, May 2024.

Published
2026 March 1

Copyright © 2026 The Author(s)



This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0).
<https://creativecommons.org/licenses/by-nc-nd/4.0/>



Abstract

Background/Aim: Unilateral sensorineural hearing loss (USNHL) impairs sound localization, reduces speech perception in noise, and may lead to academic and psychosocial consequences, particularly in children. Nevertheless, clinical approaches remain heterogeneous, and standardized management protocols are lacking. This study aimed to investigate the diagnostic and management approaches of ear, nose, and throat (ENT) physicians and residents in Türkiye regarding USNHL and to evaluate the availability of diagnostic resources and professionals involved in management.

Methods: This web-based, cross-sectional survey targeted ENT residents, specialists, and academic physicians. A structured 20-item questionnaire was administered between April 6 and April 16, 2024. Participants were required to be actively practicing in a clinic equipped with audiological assessment tools and to provide informed consent. Physicians with less than one year of ENT practice were excluded. Descriptive statistics are presented as frequency and percentage. Chi-squared tests were used for comparisons between groups.

Results: A total of 90 physicians participated; 48 (53.3%) were residents, 25 (27.8%) specialists, and 17 (18.9%) academic physicians. Most respondents (80.0%) worked in tertiary hospitals with broad access to tympanometry, audiometry, otoacoustic emissions, and brainstem evoked response audiometry. More than half (53.3%) accepted 15 dB as the diagnostic threshold for pediatric USNHL, whereas 71.1% used 25 dB as a diagnostic threshold in adults. Hearing aids were recommended for losses >40 dB by 57.0% of participants, while cochlear implantation for >80 dB USNHL was recommended by only 6.0%. Although 93.0% acknowledged difficulties in sound localization and 79.0% believed USNHL negatively affects academic performance, fewer than half (48.9%) supported definitively recommending cochlear implantation in children with very severe USNHL.

Conclusion: Despite the recognized functional burden of USNHL, considerable variability persists in diagnostic thresholds and rehabilitation preferences among ENT physicians in Türkiye. Increasing awareness of binaural hearing benefits and establishing clearer national guidance may improve rehabilitation uptake and patient outcomes.

Keywords: unilateral hearing loss, hearing rehabilitation, hearing aid, cochlear implant, survey

Introduction

Unilateral sensorineural hearing loss (USNHL) is defined as sensorineural hearing impairment in one ear, with severity ranging from mild to profound [1]. Its etiology includes idiopathic causes, Meniere's disease, neoplastic lesions, and acoustic trauma [2]. Patients commonly experience difficulty localizing sound and understanding speech in noisy environments [2-4], both of which can impair daily communication and social functioning. When the contralateral ear has normal hearing, USNHL may be underestimated, which can contribute to delayed evaluation and missed opportunities for timely rehabilitation.

International literature increasingly emphasizes the academic, psychosocial, and cognitive consequences of USNHL, particularly in pediatric populations [5-7]. Nevertheless, variability persists in defining diagnostic thresholds, selecting rehabilitation strategies, and determining candidacy for interventions such as hearing aids and cochlear implantation. In Türkiye, the absence of standardized national guidance may contribute to practice variation, and clinical decisions can be influenced by institutional capacity and reimbursement frameworks.

This study aimed to investigate the diagnostic and rehabilitation approaches of ENT physicians (residents, specialists, and academic physicians) regarding USNHL and to assess the availability of diagnostic resources and professional involvement in the evaluation and management of these patients.

Materials and methods

Study design

This study was designed as a cross-sectional, web-based survey. The reporting structure follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations.

Ethical approval and consent

Approval was obtained from the Local Ethics Committee (KÜ GOKAEK-2024/12.04). The study was conducted in accordance with the Declaration of Helsinki. Electronic informed consent was obtained from all participants before accessing the questionnaire.

Participants and setting

The survey targeted ENT residents, specialists, and academic physicians actively practicing in Türkiye. Inclusion criteria were active involvement in ENT clinical practice, availability of hearing assessment facilities in the institution, and provision of informed consent. Physicians with less than one year of ENT experience were excluded to ensure responses reflected established clinical familiarity (Table 1).

Survey instrument

A structured 20-item questionnaire was constructed using Google Forms. The instrument collected data on participant demographics, institutional facilities, diagnostic thresholds used, perceived clinical impact of USNHL, and preferred rehabilitation approaches. Each question included an optional open-ended field to capture additional comments. Although a formal pilot validation study was not performed, questionnaire content was developed based on published literature and expert consensus, and

clarity was reviewed by a small group of ENT physicians before dissemination.

Survey administration

The survey was distributed electronically via email invitations and professional social media groups between April 6 and April 16, 2024. Participation was voluntary, and no incentives were offered. Only one response per participant was permitted.

Statistical analysis

Data were analyzed using SPSS version 20.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics are presented as frequency and percentage values. Chi-squared tests were used to compare categorical variables between respondent groups (residents, specialists, and academic physicians). No statistically significant associations were observed between professional title and the choice of pediatric diagnostic threshold (15 dB vs higher; $P=0.184$), adult diagnostic threshold (25 dB vs higher; $P=0.993$), recommending cochlear implantation for profound unilateral hearing loss in children ($P=0.248$), recommending cochlear implantation for adults with profound unilateral hearing loss ($P=0.089$), or strongly agreeing that cochlear implantation should be recommended in children with very severe USNHL ($P=0.933$). Exact p-values are reported for all comparative analyses; $P<0.001$ is reported where applicable.

Results

Participant characteristics

Ninety physicians completed the survey. Of these, 48 (53.3%) were residents, 25 (27.8%) specialists, and 17 (18.9%) academic physicians. Forty-six participants (51.1%) reported 1-4 years of ENT experience, and the remainder reported longer experience. The majority (80.0%) worked in tertiary hospitals. Most institutions had tympanometry, pure-tone audiometry, otoacoustic emissions, and brainstem evoked response audiometry capabilities. Approximately half of respondents (52.2%) reported employing audiologists, and 38.9% reported having specialist audiologists.

Diagnostic thresholds and perceived clinical impact

More than half of respondents (48/90, 53.3%) accepted 15 dB as the diagnostic threshold for pediatric USNHL, while the remainder reported higher thresholds such as 25 dB or 40 dB. In adults, 64/90 physicians (71.1%) used 25 dB as the diagnostic threshold for USNHL. Comparisons across professional title did not demonstrate statistically significant differences in the use of a 15 dB pediatric threshold ($P=0.184$) or a 25 dB adult threshold ($P=0.993$). Most respondents recognized the functional effects of USNHL: 93.0% anticipated difficulty in sound localization, 79.0% believed academic performance would be negatively affected, and 53.0% associated USNHL with delayed language development.

Management approaches

Hearing amplification was recommended for hearing loss exceeding 40 dB by 57.0% of respondents. In a scenario describing a child with profound unilateral hearing loss (>80 dB), 4 physicians (4.4%) explicitly recommended cochlear implantation; in the analogous adult scenario, 3 physicians (3.3%) recommended cochlear implantation. When asked more generally whether cochlear implantation should be recommended in children with very severe USNHL, 44 respondents (48.9%)

indicated it should be definitively recommended. None of these rehabilitation preferences were significantly associated with professional title ($P=0.248$ for recommending cochlear implantation in children in the clinical scenario, $P=0.089$ for the adult scenario, and $P=0.933$ for definitively supporting cochlear implantation in very severe pediatric USNHL) (Table 2).

Table 1. Distribution of participants by professional title

Professional title	n	%
Resident	48	53.3
Specialist	25	27.8
Academician	17	18.9

Table 2. Selected diagnostic and management preferences in USNHL

Variable	n	%
Pediatric USNHL threshold of 15 dB	48	53.3
Adult USNHL threshold of 25 dB	64	71.1
Recommends hearing aid for >40 dB loss	51	57.0
Recommends cochlear implant in child with >80 dB USNHL	4	4.4
Recommends cochlear implant in adult with >80 dB USNHL	3	3.3
States cochlear implant should definitely be recommended in severe pediatric USNHL	44	48.9

USNHL: Unilateral sensorineural hearing loss

Discussion

Interpretation of diagnostic thresholds

Approximately half of the respondents adopted a 15 dB threshold for pediatric USNHL, which is consistent with commonly cited pediatric audiology classifications [8]. A substantial proportion reported using higher thresholds (e.g., 25 dB or 40 dB), which may reflect reimbursement criteria or institutional routines rather than a fundamental disagreement on clinical impact. This variability highlights a practical need to align evidence-based definitions with national policy frameworks so that diagnostic labeling and subsequent rehabilitation decisions are more consistent across settings.

Diagnostic resources and institutional capacity

Most respondents reported working in tertiary hospitals with access to key audiologic assessments, including tympanometry, audiometry, otoacoustic emissions, and brainstem evoked response testing. This suggests that, at least in higher-level institutions, diagnostic infrastructure is generally sufficient for evaluating USNHL. However, the survey distribution likely underrepresents secondary or rural centers, where access to audiologists, advanced testing, or rehabilitation pathways may be more limited; therefore, nationwide equity in diagnostic and rehabilitative capacity cannot be inferred from the current sample.

Hearing aid recommendation patterns

Although many respondents recognized the functional burden of USNHL, amplification was not uniformly recommended. The literature suggests that appropriately selected patients may experience benefits in communication and quality of life with amplification and related rehabilitation strategies [5-7]. The observed variation in recommendations may be driven by uncertainty regarding candidacy, perceived adherence challenges, local availability of hearing-aid services, and reimbursement constraints. Addressing these barriers through clearer candidacy pathways and practical guidance may help translate clinical awareness into more consistent rehabilitation practices.

Cochlear implantation attitudes

Contemporary evidence indicates that cochlear implantation for profound unilateral loss can improve binaural hearing-related outcomes and may support auditory development in pediatric patients [9-12]. Despite this evolving evidence base,

respondents appeared relatively conservative regarding cochlear implantation in USNHL, and support for implantation in children with very severe USNHL was not universal. This cautious stance may reflect limited exposure to USNHL cochlear implantation in routine practice, cost considerations, and uncertainty about patient selection and expected benefit. Focused education, dissemination of up-to-date evidence, and national consensus statements may help reduce variability and improve appropriate access to cochlear implantation where indicated.

Clinical Implications

A key practical observation is the gap between broad acknowledgment of functional challenges associated with USNHL and the variability in rehabilitation recommendations. Increased emphasis on binaural hearing benefits, standardized assessment of functional impairment, and structured counseling could strengthen shared decision-making and reduce under-treatment, particularly for children at risk of academic or psychosocial consequences. Prospective studies evaluating functional outcomes after rehabilitation in Turkish USNHL populations may further support development of context-specific recommendations.

Study Limitations

This study has limitations inherent to a web-based, cross-sectional survey design, including the potential for selection bias and limited generalizability. The sample predominantly represented physicians in tertiary centers, which may overestimate diagnostic resource availability and does not fully capture practice conditions in secondary or rural settings. In addition, the study design does not allow causal inference regarding factors influencing physician preferences. Nevertheless, the survey provides a national snapshot of practice patterns and identifies clinically relevant areas where harmonization and guidance are needed in the management of USNHL.

Conclusion

Despite widespread recognition of the functional impact of USNHL, diagnostic thresholds and rehabilitation preferences vary considerably among ENT physicians in Türkiye. Clearer national guidance, improved alignment between evidence and reimbursement frameworks, and targeted educational initiatives—particularly regarding binaural hearing benefits and contemporary indications for rehabilitation—may help reduce practice variability and improve patient-centered outcomes, especially in pediatric populations.

References

- Bishop CE, Hamadain E, Galster JA, Johnson MF, Spankovich C, Windmill I. Outcomes of hearing aid use by individuals with unilateral sensorineural hearing loss (USNHL). *J Am Acad Audiol.* 2017;28(10):941-9.
- Young YH. Contemporary review of the causes and differential diagnosis of sudden sensorineural hearing loss. *Int J Audiol.* 2020;59(4):243-53.
- Kitterick PT, Lucas L, Smith SN. Improving health-related quality of life in single-sided deafness: a systematic review and meta-analysis. *Audiol Neurootol.* 2015;20(Suppl 1):79-86.
- Dillon MT, Buss E, Rooth MA, King, ER, Deres EJ, Buchman CA, et al. Effect of cochlear implantation on quality of life in adults with unilateral hearing loss. *Audiol Neurootol.* 2018;22(4-5):259-71.
- Aldè M, Zanetti D, Ambrosetti U, Monaco E, Gasbarre AM, Pignataro L, et al. Unilateral sensorineural hearing loss in children: Etiology, audiological characteristics, and treatment. *Children (Basel).* 2024;11(3):324.
- Bencheitrit L, Stenerson M, Ronner EA, Leonard HJ, Aungst H, Stiles DJ, et al. Hearing aid use in children with unilateral hearing loss: a randomized crossover clinical trial. *Laryngoscope.* 2022;132(4):881-8.

7. Liu Y, Li H, Zhou X, Chen Y, Wang X, Lin Z, et al. Functional connectivity changes in infants with varying degrees of unilateral hearing loss. *Cereb Cortex*. 2023;33(14):9165-74.
8. Clark JG. Uses and abuses of hearing loss classification. *ASHA*. 1981;23:493-500.
9. Mertens G, Kleine Punte A, De Bodt M, Van de Heyning P. Binaural auditory outcomes in patients with postlingual profound unilateral hearing loss: 3 years after cochlear implantation. *Audiol Neurootol*. 2015;20(Suppl 1):67-72.
10. Marx M, Mosnier I, Venail F, Mondain M, Uziel A, Bakhos D, et al. Cochlear implantation and other treatments in single-sided deafness and asymmetric hearing loss: Results of a national multicenter study including a randomized controlled trial. *Audiol Neurootol*. 2021;26(6):414-24.
11. Brown KD, Dillon MT, Park LR. Benefits of cochlear implantation in childhood unilateral hearing loss (CUHL Trial). *Laryngoscope*. 2022;132(Suppl 6):S1-S18.
12. Colasacco CJ, Morgan S, Bornstein R, Drugge E, Stidham KR. Cochlear implantation in children with a long average duration of single-sided deafness. *Ann Otol Rhinol Laryngol*. 2024;133(3):345-50.

Disclaimer/Publisher's Note: The statements, opinions, and data presented in publications in the Journal of Surgery and Medicine (JOSAM) are exclusively those of the individual author(s) and contributor(s) and do not necessarily reflect the views of JOSAM, the publisher, or the editor(s). JOSAM, the publisher, and the editor(s) disclaim any liability for any harm to individuals or damage to property that may arise from implementing any ideas, methods, instructions, or products referenced within the content. Authors are responsible for all content in their article(s), including the accuracy of facts, statements, and citations. Authors are responsible for obtaining permission from the previous publisher or copyright holder if re-using any part of a paper (e.g., figures) published elsewhere. The publisher, editors, and their respective employees are not responsible or liable for the use of any potentially inaccurate or misleading data, opinions, or information contained within the articles on the journal's website.