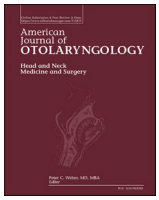
American Journal of Otolaryngology–Head and Neck Medicine and Surgery 47 (2026) 104790



Contents lists available at ScienceDirect

American Journal of Otolaryngology–Head and Neck Medicine and Surgery

journal homepage: www.elsevier.com/locate/amjoto





Treatment preferences and values in chronic tinnitus patients: A cross-sectional survey study

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ARTICLE INFO

Keywords:
Tinnitus
Patient preference
Treatment outcome
Patient-centered care
Cross-sectional study

ABSTRACT

Purpose: Tinnitus is a common condition that can severely impact patients' quality of life. However, little is known about how individuals with chronic tinnitus evaluate and prioritize available treatment options. This study aimed to explore the preferences, values and expectations of patients with chronic tinnitus to inform more patient-centered strategies in clinical care.

Material and methods: A cross-sectional survey was conducted from May 8 to June 19, 2025, involving 45 patients with chronic tinnitus. A structured 36-item questionnaire assessed demographic information, tinnitus severity using the Tinnitus Handicap Inventory (THI) and the Visual Analog Scale (VAS), treatment preferences across 16 key questions, perceived information needs, and impact on daily functioning.

Results: Participants (mean age 50.7 ± 14.8 years, 62.2% male, median tinnitus duration 12 months) showed strong preferences for non-invasive treatments: sound therapy (73.4%), tinnitus retraining therapy (TRT; 55.6%), and cognitive behavioral therapy (CBT; 44.4%). Pharmaceutical interventions had lower acceptance, with hearing aids showing highest rejection (33.3%). Key concerns included drug dependency (48.9%) and psychiatric medication stigma (28.9%). 51.1% of respondents expected complete symptom resolution despite limited evidence. Information needs were high across all modalities (40–50%). Sleep disorders (THI difference: 12.9 points) and anxiety (6.5 points) significantly associated with increased tinnitus severity.

Conclusions: Tinnitus patients strongly prefer non-invasive treatments while harboring unrealistic expectations for cure. These findings underscore the importance of structured education and shared decision-making to align clinical care with patient values and promote more effective tinnitus management.

1. Introduction

Tinnitus, the perception of sound without an external source, affects 10–15% of adults globally [1] and often impairs quality of life through comorbidities such as sleep disturbance, concentration issues, depression, and anxiety [2,3]. In Korea, 19.7% of individuals aged 12 or older reported experiencing tinnitus, with 29.3% stating it interfered with daily life [4].

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https://doi.org/10.1016/j.amjoto.2026.104790
Received 14 October 2025;
Available online 13 January 2026
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Management strategies for tinnitus are diverse, including sound therapy, Tinnitus Retraining Therapy (TRT), Cognitive Behavioral Therapy (CBT), pharmacological treatments, hearing aids (HAs), neuromodulation, and neurofeedback [5]. However, international clinical guidelines for tinnitus vary considerably in their recommendations. 10 major guidelines published between 2011 and 2021 agreed that only counseling and CBT were consistently endorsed [6]. In contrast, recommendations for TRT, sound therapy, HAs, and cochlear implants varied across the guidelines due to limited evidence or perceived inefficacy [6]. The American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) advises against routine use of antidepressants, anticonvulsants, anxiolytics, and supplements like ginkgo biloba and zinc [7]. Meanwhile, the European guideline emphasizes that although the efficacy of such medication is limited and the supporting evidence in insufficient, they are not entirely excluded from consideration, and an individualized approach based on the patient's condition is recommended [8]. Such differences arise from variability in evidence quality, methodological inconsistencies, and limited integration of patient preferences. These discrepancies reflect not only variability in evidence and methodology, but also the lack of guidelines built on patient preferences and values [9].

Given the chronic and multidimensional nature of tinnitus, incorporating patient values into treatment decisions is essential for improving adherence, satisfaction, and outcomes. Prior research highlights that alignment between clinician recommendations and patient expectations fosters better communication and results [10]. However, shared decision-making remains underutilized in tinnitus care, and patients often enter treatment with unrealistic hopes for a complete cure and a preference for self-manageable approaches. Mismatches between provider assumptions and patient needs may result in dissatisfaction and reduced treatment efficacy [11].

Despite the increasing global burden of tinnitus, few studies have systematically examined patient preferences. The diversity of healthcare systems and cultural factors limits the direct applicability of international findings to local settings. This study aims to investigate treatment preferences and decision-making factors in Korean patients with chronic tinnitus, providing foundational data for developing patient-centered and culturally appropriate clinical strategies.

2. Materials and methods

2.1. Study design and participants

We conducted a cross-sectional survey from May 8 to June 19, 2025, in accordance with STROBE guidelines. Participants were chronic tinnitus patients visiting the otorhinolaryngology clinic of a tertiary hospital. Inclusion criteria were: 1) adults aged ≥19 years; 2) tinnitus as the primary complaint for ≥3 months; 3) voluntary consent; and 4) ability to complete the questionnaire. Exclusion criteria included: 1) objective tinnitus; 2) cognitive impairment; and 3) refusal to participate.

2.2. Study instruments

A structured 36-item questionnaire covered the following domains:

1. Demographics (4 items): sex, age, education, occupation.
2. Tinnitus-related clinical data (6 items): duration, 10-point tinnitus distress scale, Tinnitus Handicap Inventory (THI), tinnitus characteristics (pitch, pattern), medical history (e.g., noise exposure, head trauma), associated symptoms (e.g., hearing loss, anxiety, depression, sleep disturbance), comorbidities (e.g., hypertension), previous treatment experience (with 4-point efficacy rating), and presumed cause.
3. Tinnitus evaluation and diagnosis (5 items): preferences for assessment methods, components to be evaluated, views on audiometry, need for imaging studies, and decision-making factors for imaging studies.
4. Treatment methods and preferences (16 items): attitudes toward TRT, CBT, hearing aids, sound therapy, anxiolytics, antidepressants, neuromodulation, and supplements (ginkgo, zinc, magnesium), including preferred formats and selection concerns.
5. Daily life and management (5 items): treatment goals, valued aspects of provider communication, tinnitus impact on daily life, information sources, and recovery-related concerns.

2.3. Sample size calculation

The sample size was estimated using the formula for simple proportions based on Husain et al. [12]:

$$n = (Z^2pq)/E^2, \text{where Z} = 1.96\ (95\%\text{CI}), p = 0.5, \text{q} = 0.5, \text{and E} = 0.15$$

The calculated sample size was 43, and 45 were recruited to allow for 5% attrition.

2.4. Ethical considerations

The study was approved by the Institutional Review Board of the author's institution (the Ewha Womans University Mokdong Hospital approval No: EUMC 2025-03-011-003). Informed consent was obtained from all participants. Data were anonymized using coded identifiers in accordance with the Declaration of Helsinki.

2.5. Statistical analysis

Internal consistency of multi-item scales was assessed using Cronbach's alpha, with values ≥0.7 considered acceptable. Exploratory factor analysis with varimax rotation was conducted to examine the underlying structure of treatment preferences. Based on the factor analysis results, we created theoretically meaningful subscales for subsequent analyses. Continuous variables were described using means and SDs or medians with IQRs; categorical variables as frequencies and percentages. Group differences were tested with *t*-tests (sex) and ANOVA (age groups). Multiple linear regression identified THI predictors. A *p*-value less than 0.05 was considered statistically significant. Analyses were performed in R version 4.3.0 (R Foundation for Statistical Computing, Vienna, Austria).

3. Results

3.1. Demographic and clinical characteristics

A total of 45 patients (62.2% male) participated in the survey (Table 1), with a mean age of 50.7 ± 14.8 years (range: 22–76). Regarding educational attainment, 10 (22.2%) had graduate degrees, 18 (40.0%) had undergraduate degrees, 12 (26.7%) had completed high school, and 5 (11.1%) had middle school education or less. The median tinnitus duration was 12 months (IQR: 3–36 months), with 53.3% reporting symptoms lasting over a year. Continuous tinnitus (71.1%) and high-pitched tinnitus (51.1%) were most common. Mean THI and VAS scores were 38.0 ± 24.8 and 5.8 ± 2.4, respectively. Comorbid symptoms included anxiety (33.3%), hearing loss (31.1%), neck pain (27.3%), ear fullness (27.3%), and sleep disturbance (24.4%).

Most patients (75.6%) had prior treatment experience (Table 2). Pharmacotherapy was the most common, though 52.9% reported no benefit. Counseling therapy, although less frequently used (11.8%), received higher satisfaction scores (1.75/3.0).

3.2. Reliability and factor structure of the questionnaire

To ensure the validity of the questionnaire, we analyzed its internal

Table 1
Demographic and clinical characteristics of study participants (n = 45).

Characteristics	n (%) or Mean ± SD / Median [IQR]
Sex	
Male	28 (62.2)
Female	17 (37.8)
Age (years)	50.7 ± 14.8
20–39	13 (28.9)
40–59	14 (31.1)
≥ 60	18 (40.0)
Education Level	
Graduate school or higher	10 (22.2)
College graduate	18 (40.0)
High school graduate	12 (26.7)
Middle school or less	5 (11.1)
Occupation	
Unemployed/Retired	8 (17.8)
Homemaker	5 (11.1)
Office worker	9 (20.0)
Self-employed	3 (6.7)
Professional	4 (8.9)
Others	16 (35.6)
Duration of tinnitus (months)	12.0 [IQR: 3–36]
< 6 months	16 (35.6)
6–12 months	5 (11.1)
> 12 months	24 (53.3)
Tinnitus pattern	
Continuous	32 (71.1)
Intermittent	13 (28.9)
Tonal quality	
High-pitched	23 (51.1)
Low-pitched	5 (11.1)
Mixed	6 (13.3)
THI score	38.0 ± 24.8
0–16	11 (24.4)
18–36	11 (24.4)
38–56	15 (33.3)
58–76	2 (4.4)
78–100	6 (13.3)
VAS score	5.8 ± 2.4
Comorbid symptoms	
Anxiety	15 (33.3)
Hearing loss	14 (31.1)
Neck pain	12 (27.3)
Ear fullness	12 (27.3)
Sleep disturbance	11 (24.4)

THI; tinnitus handicap inventory, VAS; visual analogue scale.

consistency and explored the underlying factor structure, aiming to determine whether patient responses reflected coherent constructs related to treatment preferences.

The internal consistency of the scales varied considerably (Table 3). The psychiatric medication subscale (anxiolytics and antidepressants) demonstrated excellent reliability (α = 0.91), reflecting patients' unified attitudes toward these treatments. The overall treatment preference scale showed moderate reliability (α = 0.66 with supplements), suggesting that patients evaluate each treatment modality independently rather than as a unified construct. Factor analysis revealed a two-factor structure explaining 48.1% of the variance. Factor 1 comprised psychiatric medications (anxiolytics: 0.94, antidepressants: 0.89), while Factor 2 included counseling-based therapies (TRT: 0.73, CBT: 0.72). This structure supported creating separate subscales for psychiatric medications and counseling therapies, with acceptable reliability for the latter (α = 0.69). The information needs scale showed low reliability (α = 0.60), consistent with patients' independent evaluation of information requirements for each treatment. The comorbid symptoms scale improved from α = 0.63 to α = 0.66 after reverse-coding negatively correlated items.

3.3. Preference for evaluation and diagnosis

More than half (55.6%) preferred tinnitus assessments that included both subjective and objective measures. Audiometry was considered essential by 62.2%, and but 68.9% indicated that imaging should be based on physician judgment. The dominant factor when deciding on imaging was “possibility of accurate diagnosis” (91.1%), outweighing safety or cost. Key components patients wanted reflected in evaluations included loudness (60.0%) and functional impact, especially on sleep and concentration (33.3%).

3.4. Treatment preference

Non-invasive treatments were strongly favored (Fig. 1) that sound therapy (73.4%), TRT (55.6%), and CBT (44.4%) were the most preferred. In contrast, pharmaceutical options were less popular (31.1–40.0%), with hearing aids (HAs) receiving the highest rejection rate (33.3%). Among pharmaceuticals, dietary supplements (e.g., ginkgo, zinc, magnesium) showed relatively high acceptance (40.9%) and the lowest rejection (6.7%), though 51.1% wanted more information about them.

Information needs were consistently high (40–50%) across most treatments. Notably, patients with higher education levels expressed markedly higher information needs for treatment compared to those with a high school education or less. They also relied more on formal sources such as medical text and journals (25.0%) and consultations with healthcare providers (53.6%), while those with a high school education or less used internet searches (82.4%) and social media (41.2%)

Table 3
Internal consistency and factor structure of the questionnaire.

Scales	Items	n	α
Primary scale			
Treatment preference	All treatment	45	0.66
Information needs	All treatments (TRT: 42.2%, CBT: 51.1%, HAs: 40.0%, Sound therapy: 22.2%, Anxiolytics: 44.4%, Antidepressants: 48.9%, Neuromodulation: 51.1%, Supplements: 51.1%)	45	0.60
Comorbid symptoms	10 symptoms (Hearing loss, dizziness, depression, anxiety, hyperacusis, sleep disturbance, insomnia, headache, neck pain, ear fullness)	45	0.66
Subscales			
Psychiatric medications	Anxiolytics, Antidepressants	45	0.91
Counseling based treatments	TRT, CBT	45	0.69
Non-pharmacological treatments	TRT, CBT, sound therapy, Neuromodulation	45	0.66

TRT; tinnitus retraining therapy, CBT; cognitive behavioral therapy, HAs; hearing aids.

Table 2
Treatment experiences and perceived effectiveness.

Treatment Type	n (%)	No Effect (0)	Mild (1)	Moderate (2)	Marked (3)	Mean Effect Score
Medication	34 (75.6)	18 (52.9)	7 (20.6)	3 (8.8)	6 (17.6)	0.91 ± 1.19
Counseling	4 (8.9)	0 (0.0)	1 (25.0)	3 (75.0)	0 (0.0)	1.75 ± 0.50
Sound therapy	4 (8.9)	1 (25.0)	2 (50.0)	1 (25.0)	0 (0.0)	1.00 ± 0.82
Neuromodulation	2 (4.4)	1 (50.0)	0 (0.0)	1 (50.0)	0 (0.0)	1.00 ± 1.41
Herbal/ Supplements	1 (2.2)	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0.00 ± 0.00

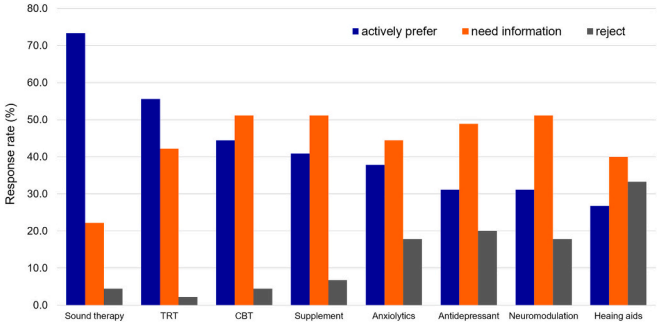


Fig. 1. Patient preferences and information needs for tinnitus treatments. Bar chart displaying the distribution of patient responses ($n = 45$) for eight treatment options. For each treatment, the proportion of patients who actively prefer (blue), need more information (orange), or reject (gray) the treatment option is shown. Sound therapy received the highest active preference (73.3%), while hearing aids were most frequently rejected (33.3%). Information needs were greatest for cognitive behavioral therapy (CBT), neuromodulation, and supplements (each 51.1%) and lowest for sound therapy (22.2%), indicating significant variability in treatment familiarity among patients.

more frequently.

3.5. Decision-making factors

Analysis of key decision factors for treatment selection revealed different priorities for each treatment modality. For non-pharmacological treatment selection, "sufficient explanation and education by experts" was most valued for TRT (42.2%), with "regular follow-up" (24.4%) and "practical advice" (24.4%) also considered important. For sound therapy, patients preferred structured treatment administered at a medical institution over the use of personal or home sound generators (51.1%). Regarding cognitive behavioral therapy, individual face-to-face counseling was preferred over group therapy (40.0%). This indicates a preference for active, structured, and personalized treatment provided by healthcare professionals. For HAs selection, the "tinnitus relief effect" (57.8%) was valued more than twice as much as the "hearing improvement effect" (26.7%), indicating that tinnitus patients perceive HAs as primary tools for tinnitus treatment rather than simple hearing assistive devices.

Regarding pharmaceutical treatment concerns, for anxiolytics, "drug dependency" (48.9%) and "long-term side effects" (31.1%) were primary concerns, while for antidepressants, "stigma of psychiatric medication" (28.9%) and "need for long-term use" (26.7%) were similarly concerning. This demonstrates how social perceptions of psychiatric medications influence treatment decisions.

For novel treatment selection criteria, when deciding on neuromodulation, "treatment efficacy and success rate" (57.8%) was considered far more important than "safety and side effects" (22.2%). For dietary supplements, "clinical evidence of efficacy" (46.7%) and "side effects and safety" (35.6%) were primary criteria, with only 8.9% considering the "cost" important. Patients' decision making factors are listed in Fig. 2.

3.6. Patient-defined treatment goals and concerns

For treatment goals, 51.1% hoped for complete symptom resolution, followed by reducing distress (20.0%) and improve daily function (11.1%). The most significant concern during treatment was potential worsening of tinnitus (60.0%). In communication with healthcare providers, patients valued detailed explanation of causes and treatments (44.4%) and realistic guidance (33.3%).

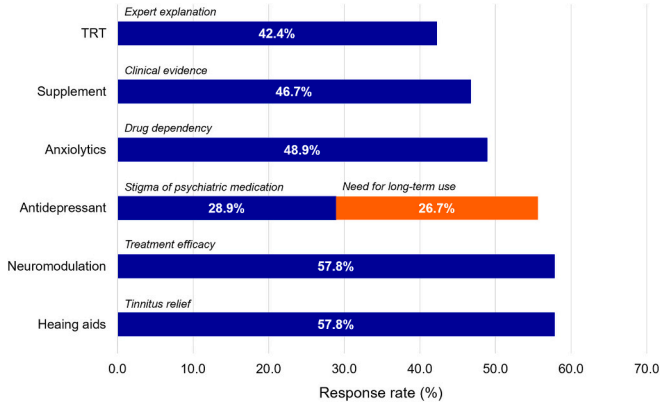


Fig. 2. Key decision-making factors influencing treatment selection for tinnitus. Bar chart displaying the primary factors patients considered when deciding whether to undergo each tinnitus treatment modality. For each treatment, the percentage of patients citing each factor is shown.

3.7. Tinnitus severity-related factors

Females (THI 45.3 ± 27.4) exhibited a higher severity of symptoms than males (THI 33.0 ± 22.1), although the difference was not statistically significant ($p = 0.104$). Comorbidities had a significant influence on THI scores. Patients with sleep disorders showed the largest differences in THI scores than those without (48.3 vs. 35.4) Patients with anxiety symptoms had 6.5 points higher THI scores (42.0 vs 35.5), and those with hyperacusis showed a 5.4-point difference (42.0 vs 36.6). Interestingly, depressive symptoms showed a relatively small difference (2.8 points). In comparison, patients with hearing loss paradoxically showed THI scores 3.7 points lower (35.2 vs 38.9), suggesting hearing loss patients may accept tinnitus as part of their hearing impairment and experience relatively less distress.

Multiple regression analysis was performed to identify factors influencing THI scores. The model, including age, sex, tinnitus duration, and several comorbid symptoms as predictors, was not statistically significant ($F(4,40) = 1.04$, $p = 0.400$, $R^2 = 0.094$). These findings suggest that tinnitus severity may be influence more by complex psychosocial factors than by basic demographic or clinical variables.

4. Discussion

This study is the first to systematically explore treatment preferences and values in Korean patients with chronic tinnitus, providing foundational data for patient-centered care. The factor analysis revealing distinct dimensions for psychiatric medications versus counseling-based approaches provides important clinical insights. High internal consistency of psychiatric medication preferences suggests a unified attitude toward such interventions, likely reflecting shared stigma or acceptance. The moderate reliability of overall treatment preferences should not be interpreted as poor measurement quality. Rather, it reflects the multidimensional nature of tinnitus treatment evaluation, where patients make independent decisions based on specific characteristics of each modality. This finding aligns with the heterogeneous nature of tinnitus itself and supports individualized treatment approaches.

The most notable finding was patients' strong preference for non-invasive treatments such as sound therapy and TRT, likely due to safety concerns and a desire for natural approaches. This aligns with recent international guideline recommendations. The AAO-HNS guideline suggests that sound therapy may be offered as an option for patients with persistent, bothersome tinnitus [7], and the European multidisciplinary guideline also recommends sound therapy as an adjunctive treatment [8]. However, the evidence for sound therapy alone remains inconclusive, though no adverse effects have been reported [13]. The

high preference observed in our study suggests that patients prioritize safety and favor non-invasive approaches. Conversely, low preference and high rejection rates for pharmaceutical treatments also align with current guideline. AAO-HNS recommends against routine use of antidepressants, anticonvulsants, and anxiolytics [7], and recent meta-analyses have shown that commonly used medications like betahistine lack tinnitus-specific therapeutic effects [14]. Patients' primary concerns about drug dependency and long-term side effects in our study correspond with these evidence-based recommendations.

The finding that 40–50% of patients desire additional information across all treatment modalities reveals a gap in current practice. This aligns with prior research that tinnitus patients prefer individualized information and interactive approaches [10]. Patient participation in decision-making that reflects their preferences is crucial in conditions like tinnitus, where no single optimal treatment exists, and each intervention has its advantages and disadvantages. Patients in our study valued "detailed explanation of causes and treatments" and "realistic treatment guidance" in communication with healthcare providers, indicating the need for decision-making processes that consider patient values and preferences beyond simple information transfer.

The analysis of the factors influencing patients' treatment decisions provide several important insights. Patients strongly prioritized accurate diagnosis when considering imaging, reflecting their desire for clear tinnitus etiology. This underscores the pathophysiological uncertainty in tinnitus [15], and highlights the need for honest explanations regarding the current understanding of tinnitus mechanisms and the limitations of diagnostic tests. The prioritization of tinnitus relief effect over hearing improvement in HAs selection provides direction for patient education. HAs are well-established for providing tinnitus relief in patients with accompanying hearing loss, not only by masking tinnitus through the amplification of ambient sounds but also by normalizing central auditory gain by providing sound in frequency bands where the hearing loss occurs, thereby inducing tinnitus reduction through neuroplastic changes with long-term use [16]. These insights can guide more targeted patient education. Finally, stigma regarding psychiatric medications and dependency concerns emphasize the need for sufficient counseling and education before initiating pharmacotherapy, suggesting the importance of culturally sensitive approaches considering patients' negative perceptions of psychiatric treatment.

More than half of patients hoped for complete tinnitus resolution, despite most existing treatments focus on symptom relief and improving quality of life [5,17,18]. Such unrealistic expectations may lead to treatment dissatisfaction and a deterioration of the provider-patient relationship. Setting realistic expectations has a positive impact on treatment outcomes and satisfaction [11], making structured counseling a crucial component of the treatment initiation process. Educational interventions have demonstrated efficacy in multiple studies, with education and counseling alone reducing tinnitus-related distress, recommended as first-line interventions in all guidelines [4,7,8].

Comorbid symptoms were associated with greater tinnitus severity that it underscores the importance of evaluating and managing them in tinnitus treatment. Recent studies report a high correlation between tinnitus severity and sleep disorders necessitating sleep improvement interventions, with consistent reports of strong associations between anxiety, depression, and stress [19,20]. A detailed evaluation of comorbid symptoms is essential for improving treatment efficacy, which may require multidisciplinary, integrated management.

The higher information needs and increased utilization of medical information sources in higher education groups suggests the need for tailored information provision. Health literacy may significantly influence treatment decisions and health outcomes [21], requiring healthcare providers to consider patients' education levels and information processing capabilities when providing information.

Interestingly, dietary supplements showed unique preference patterns, with the lowest rejection rate and relatively high preference, while patients primarily considered clinical evidence. This suggests patients perceive supplements as 'natural' or 'safe' treatments while simultaneously demanding scientific evidence, indicating a rational approach. However, current guidelines do not recommend dietary supplements like ginkgo biloba or zinc, as recent Cochrane reviews have reported uncertainty about the benefits and harms of ginkgo biloba and no demonstrated tinnitus-specific effects for zinc [7,8,22,23]. Healthcare providers should clearly explain the limited evidence for supplements and prevent excessive expectations.

Finally, based on these findings, we suggest the following clinical implications:

1. Stepwise treatment approach: Offer non-invasive treatments (sound therapy, TRT, CBT) as first-line options, considering patient preferences while thoroughly evaluating and objectively explaining the evidence level for each treatment.
2. Structured information provision: Develop standardized information protocols and decision aids enabling all patients to make informed treatment choices.
3. Realistic expectation setting: Provide structured counseling before treatment initiation to foster a realistic understanding of tinnitus characteristics, treatment goals, and expected outcomes.
4. Individualized approach: Develop tailored treatment strategies considering sex, comorbid symptoms, and education level.
5. Multidisciplinary integrated management: Comprehensive evaluation and management of tinnitus and comorbid symptoms (sleep disorders, anxiety, depression) are necessary.
6. Continuous monitoring: Regularly assess treatment response and changes in preference to adjust treatment plans.

This study has several limitations. As a single-center study with a modest sample size, generalizability is limited and subgroup analyses were constrained. The cross-sectional design precludes causal inference, and objective measures of treatment efficacy were not assessed. Future work should involve multicenter, longitudinal, and interventional studies, along with decision aid development. Meanwhile, the moderate to low reliability of some scales (e.g., information needs $\alpha = 0.60$) requires careful interpretation that it may reflect the multidimensional nature of treatment evaluation in chronic tinnitus, where patients make independent decisions for each modality, rather than indicating poor measurement.

In conclusion, Korean tinnitus patients prefer non-invasive treatments and require sufficient information provision and realistic treatment goal setting. High information needs and unrealistic treatment expectations suggest the necessity for systematic patient education and shared decision-making. Patient-centered, values-based, tailored treatment strategies, along with shared decision-making, are key elements for successful tinnitus management. As the first systematic investigation of treatment preferences among Korean tinnitus patients, this study provides important foundational data for developing patient-centered tinnitus practice guidelines. It could lay the groundwork for the future development of patient-centered tinnitus practice guidelines and decision-making tools.

CRediT authorship contribution statement

Jeon Mi Lee: Supervision, Writing – original draft, Writing – review & editing. **Hyun Jung Kim:** Supervision. **Yong-Hwi An:** Supervision. **Ah. Rang Cho:** Supervision. **Jae Ho Chung:** Supervision. **Jae Sang Han:** Supervision. **Woojae Han:** Supervision. **Da Jung Jung:** Supervision. **Jung-Yup Lee:** Supervision. **Euyhyun Park:** Supervision. **Kyu-Yup Lee:** Conceptualization, Funding acquisition, Supervision. **Ho Yun Lee:** Conceptualization, Data curation, Formal analysis, Methodology, Supervision, Writing – original draft, Writing – review & editing.

Ethics statement

The study was approved by the Institutional Review Board of Ewha Womans University Mokdong Hospital. Informed consent was obtained from all participants. Data were anonymized using coded identifiers in accordance with the Declaration of Helsinki.

Declaration of Generative AI and AI-assisted technologies in the writing process

The author(s) declare that no Gen AI was used in the creation of this manuscript.

Funding

This research was supported by a grant of Patient-Centered Clinical Research Coordinating Center (PACEN) funded by the Ministry of Health & Welfare, Republic of Korea (grant number: RS-2024-00450044), and the Korea Health Technology R&D project through the Korean Health Industry Development Institute (KHIDI), funded by the Ministry of Health & Welfare, Republic of Korea (grant number: RS-2022-KH130590).

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data availability

The data supporting the findings of this case report are available from the corresponding author upon reasonable request.

References

[1] McCormack A, Edmondson-Jones M, Somerset S, Hall D. A systematic review of the reporting of tinnitus prevalence and severity. Hear Res 2016 Jul;337:70–9.
[2] Bhatt JM, Lin HW, Bhattacharyya N. Prevalence, severity, exposures, and treatment patterns of tinnitus in the United States. JAMA Otolaryngol Head Neck Surg 2016 Oct 1;142(10):959–65.
[3] Langguth B, Kreuzer PM, Kleinjung T, De Ridder D. Tinnitus: causes and clinical management. Lancet Neurol 2013 Sep;12(9):920–30.
[4] Park KH, Lee SH, Koo JW, Park HY, Lee KY, Choi YS, et al. Prevalence and associated factors of tinnitus: data from the Korean National Health and nutrition examination survey 2009-2011. J Epidemiol 2014;24(5):417–26.
[5] Lee HY, Jung DJ. Recent updates on tinnitus management. J Audiol Otol 2023 Oct;27(4):181–92.
[6] Meijers S, Stegeman I, van der Leun JA, Assegaf SA, Smit AL. Analysis and comparison of clinical practice guidelines regarding treatment recommendations for chronic tinnitus in adults: a systematic review. BMJ Open 2023 Sep 15;13(9):e072754.
[7] Tunkel DE, Bauer CA, Sun GH, Rosenfeld RM, Chandrasekhar SS, Cunningham Jr ER, et al. Clinical practice guideline: tinnitus. Otolaryngol Head Neck Surg 2014 Oct;151(2 Suppl):S1–s40.
[8] Cima RFF, Mazurek B, Haider H, Kikidis D, Lapira A, Noreña A, et al. A multidisciplinary European guideline for tinnitus: diagnostics, assessment, and treatment. Hno 2019 Mar;67(Suppl. 1):10–42.
[9] Schlee W, Schoisswohl S, Staudinger S, Schiller A, Lehner A, Langguth B, et al. Towards a unification of treatments and interventions for tinnitus patients: the EU research and innovation action UNITI. Prog Brain Res 2021;260:441–51.
[10] Pryce H, Hall A, Marks E, Culhane BA, Swift S, Straus J, et al. Shared decision-making in tinnitus care - an exploration of clinical encounters. Br J Health Psychol 2018 Sep;23(3):630–45.
[11] Pryce H, Hall A, Shaw R, Culhane BA, Swift S, Straus J, et al. Patient preferences in tinnitus outcomes and treatments: a qualitative study. Int J Audiol 2018 Oct;57(10):784–90.
[12] Husain FT, Gander PE, Jansen JN, Shen S. Expectations for tinnitus treatment and outcomes: a survey study of audiologists and patients. J Am Acad Audiol 2018 Apr;29(4):313–36.
[13] Sereda M, Xia J, El Refaie A, Hall DA, Hoare DJ. Sound therapy (using amplification devices and/or sound generators) for tinnitus. Cochrane Database Syst Rev 2018 Dec 27;12(12):Cd013094.
[14] Wegner I, Hall DA, Smit AL, McFerran D, Stegeman I. Betahistine for tinnitus. Cochrane Database Syst Rev 2018 Dec 28;12(12):Cd013093.
[15] Shore SE, Roberts LE, Langguth B. Maladaptive plasticity in tinnitus–triggers, mechanisms and treatment. Nat Rev Neurol 2016 Mar;12(3):150–60.
[16] Yakunina N, Lee WH, Ryu YJ, Nam EC. Tinnitus suppression effect of hearing aids in patients with high-frequency hearing loss: a randomized double-blind controlled trial. Otol Neurotol 2019 Aug;40(7):865–71.
[17] Langguth B, Elgoyhen AB, Cederroth CR. Therapeutic approaches to the treatment of tinnitus. Annu Rev Pharmacol Toxicol 2019 Jan;6(59):291–313.
[18] Shin SH, Byun SW, Lee HY. Initial response to combination therapies for tinnitus: lessons learned from a retrospective analysis. Otol Neurotol 2024 Jan 1;45(1):100–6.
[19] Han SY, Seo HW, Lee SH, Chung JH. Relationship between chronicity and severity of tinnitus and sleep-related issues. Otol Neurotol 2025 May 22. https://doi.org/10.1097/mao.0000000000004552.
[20] Lee HY, Shin SH, Byun SW. Impact of short-term tinnitus treatment on cognitive function and neural synchronization. Front Neurol 2025;16:1478033.
[21] Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. Ann Intern Med 2011 Jul 19;155(2):97–107.
[22] Sereda M, Xia J, Scutt P, Hilton MP, El Refaie A, Hoare DJ. Ginkgo biloba for tinnitus. Cochrane Database Syst Rev 2022 Nov 16;11(11):Cd013514.
[23] Person OC, Puga ME, da Silva EM, Torloni MR. Zinc supplementation for tinnitus. Cochrane Database Syst Rev 2016 Nov 23;11(11):Cd009832.