Avaliação da abordagem diagnóstica e terapêutica dos acufenos na prática dos otorrinolaringologistas portugueses

Artigo Original

Autores

Miguel Padrão
Unidade Local de Saúde da Região de Aveiro;
Centro Académico Clínico Egas Moniz

Diogo Dias
Unidade Local de Saúde da Região de Aveiro;
Centro Académico Clínico Egas Moniz

Margarida Bulha
Unidade Local de Saúde da Região de Aveiro;
Centro Académico Clínico Egas Moniz

Sandra Augusto
Unidade Local de Saúde da Região de Aveiro;
Centro Académico Clínico Egas Moniz

José Romão
Unidade Local de Saúde da Região de Aveiro;
Centro Académico Clínico Egas Moniz

Luísa Azevedo
Unidade Local de Saúde da Região de Aveiro;
Centro Académico Clínico Egas Moniz

Correspondência:
Miguel Padrão
miguelpadrao@campus.ul.pt

Artigo recebido a 11 de Julho de 2025.
Aceite para publicação a 20 de Setembro de 2025.

Resumo

O acufeno é frequentemente descrito como uma percepção auditiva na ausência de estímulo externo. Constitui uma preocupação significativa para a saúde pública, observando-se uma variação considerável nos cuidados prestados por diferentes profissionais de saúde. Realizámos um inquérito online através da lista de correio da Sociedade Portuguesa de Otorrinolaringologia, Cirurgia de Cabeça e Pescoço (SPORL), recolhendo 75 respostas entre agosto e outubro de 2024, para avaliar a abordagem dos mesmos. Os resultados revelaram que os otorrinolaringologistas portugueses avaliam normalmente menos de 10 doentes com acufeno por semana, principalmente com comorbidades cardiovasculares e psiquiátricas, em consultas de 20 a 30 minutos e em centros sem consultas especializadas. Os exames físicos e audiométricos são priorizados, com a ressonância magnética fortemente recomendada em casos unilaterais ou pulsáteis. Nenhuma ferramenta de avaliação subjetiva é empregue para avaliar o impacto dos acufenos na qualidade de vida. O estabelecimento de equipas multidisciplinares foi considerado uma prioridade. Houve uma ampla insatisfação com as opções de prescrição e o estado atual da investigação sobre o tema.

Palavras-Chave: Acufeno; padrão de cuidados; evidência; otologia; otoneurologia; normas de orientação clínica.

Introduction

Tinnitus represents a significant public health issue, affecting nearly 15% of European adults[2], with the prevalence rising to up to 24% in individuals over 65 years of age[3]. Although most individuals with tinnitus lead relatively normal lives, for 10–20% of patients, tinnitus becomes debilitating, leading to sleep disturbances, psychiatric comorbidities, and even suicidal ideation[4]. In these cases, it can configure a debilitating condition, without any evidence-based definitive cure[5]. A recent systematic review estimated the economic

burden of tinnitus management to amount to 7246€ per patient-year, highlighting its significant cost to healthcare systems in the US, Netherlands and the UK[6].

Despite recent efforts, that have enhanced our knowledge of tinnitus, its exact mechanisms, measurement methods, and universally effective treatments are yet to be fully understood[7]. Most treatment studies reported no significant difference between the intervention and control groups. As of today, there exist many pathophysiological models of tinnitus[8], which cannot fully explain the majority of clinical aspects of tinnitus. There are plenty of tinnitus guidelines[9] and moderate agreement between national and international guidelines for its diagnosis and treatment. However, there is still considerable variation in tinnitus-related healthcare among healthcare professionals[10].

Objectives

To deepen the understanding of the attitudes, expectations, perceived gaps, and needs of otolaryngologists practicing in Portugal, regarding the diagnosis, follow-up, and treatment of patients suffering from tinnitus.

Materials and Methods

We distributed an online questionnaire (attachment 1), consisting of 30 questions, made via Google Forms®, through the SPORL mailing list, with a target of 100 answers. It was open to otolaryngologists practicing in Portugal, between August and October 2024. In the questionnaire, the term tinnitus was explicitly referred as a primary phenomenon (unless expressed otherwise) with chronic (> 6 months) duration. We based our questions on those asked in the study "Tinnitus healthcare: a survey revealing extensive variation in opinion and practices across Europe"[10]. The statistical analysis was performed with Python (version 3.12.3), and the packages matplotlib (version 3.10.0), openpyxl (version 3.2.0) seaborn (version 0.3.2), pandas (version 2.2.3) and scipy (version 1.15.0). We considered values with $p<0,05$ to be statistically significant.

Results

A total of 75 valid responses were collected, with ages ranging from 26 to 80 years (mean 45.5 ± 14.2 years; median 42; mode 31) (fig.1).

Most physicians (49.3%) attend to between 6–10 tinnitus patients per week, followed by 37.3% who report between 1–5. Only 13.3% report more than 10 consultations per week. The average consultation time was 20–30 minutes in 81.3% of cases, less than 20 minutes in 8%, and more than 40 minutes in only 1.3%. Most centers (92%) do not have a specialized tinnitus consultation.

Comorbidities

The most reported were psychiatric (66.7%), cardiovascular (62.7%), sleep disorders (57.3%) and metabolic (45.3%). Temporomandibular joint disorders and bruxism were also reported (Table 1).

Table 1
Reported comorbidities for patients with tinnitus

Comorbidity	n (%)
Psychiatric	50 (66.7%)
Cardiovascular	47 (62.7%)
Sleep disorders	43 (57.3%)
Metabolic	34 (45.3%)
Neurological	11 (14.7%)
Other (TMJ, bruxism)	6 (8%)

Diagnostic evaluation

Physical examination and tonal audiometry were the most valued tools, particularly in non-pulsatile cases. In unilateral pulsatile tinnitus, MRI was the first-line exam in 70.7% of cases, while in bilateral pulsatile tinnitus angio-MRI (65.3%) and carotid ultrasound (48%) predominated (Figs. 2,3). Only 6.7% use the Tinnitus Handicap Inventory[11], a 25-item self-report measure to determine perceived tinnitus handicap severity (THI)

Treatment

Most respondents reported using cognitive behavioral therapy (48%), hearing aids

Figure 1
Age distribution

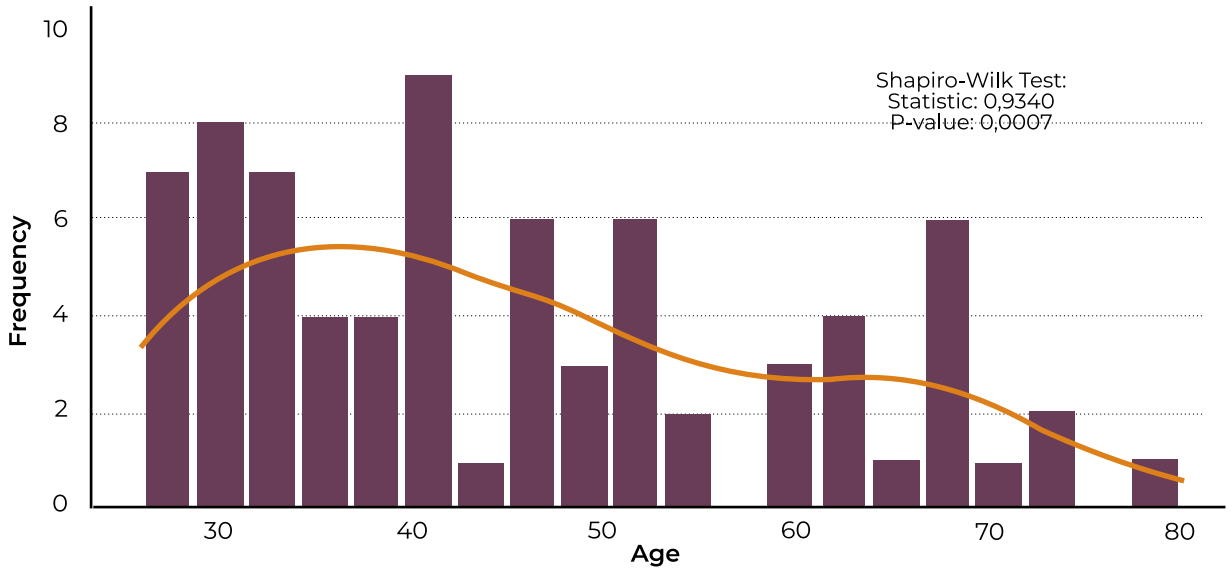
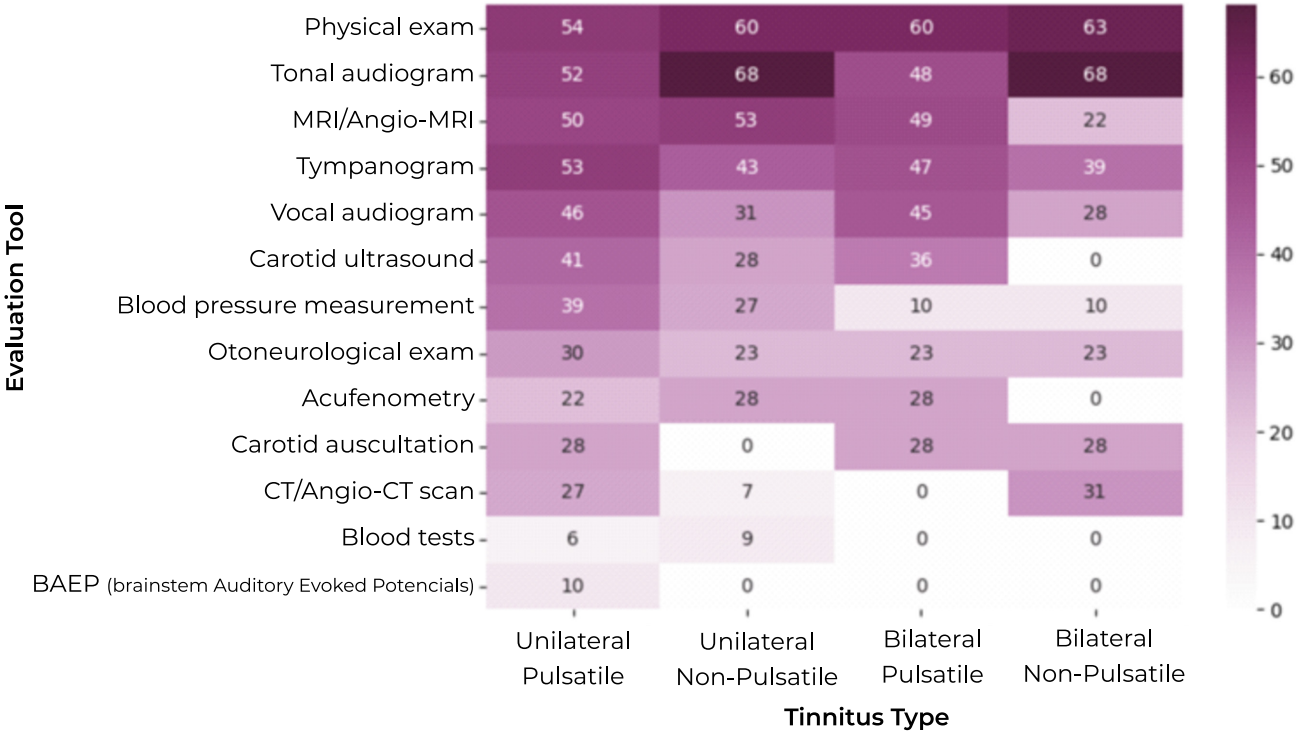


Figure 2
Diagnostic Evaluation by Tinnitus Type (heatmap)



(45.3%), tinnitus retraining therapy (40%), and sound generators (28%). Supplements were prescribed by 60%, especially ginkgo biloba (45%). Medications were not prescribed by 64%, but when used included anxiolytics (14.7%) and antidepressants (14.7%) (Table 2).

Satisfaction

82.7% of respondents reported dissatisfaction with available therapeutic options and 62.7% with the state of tinnitus research. Physicians' perception of patient satisfaction was also low (74.6% dissatisfied).

Figure 3
Diagnostic Evaluation by Tinnitus Type (grouped bars)

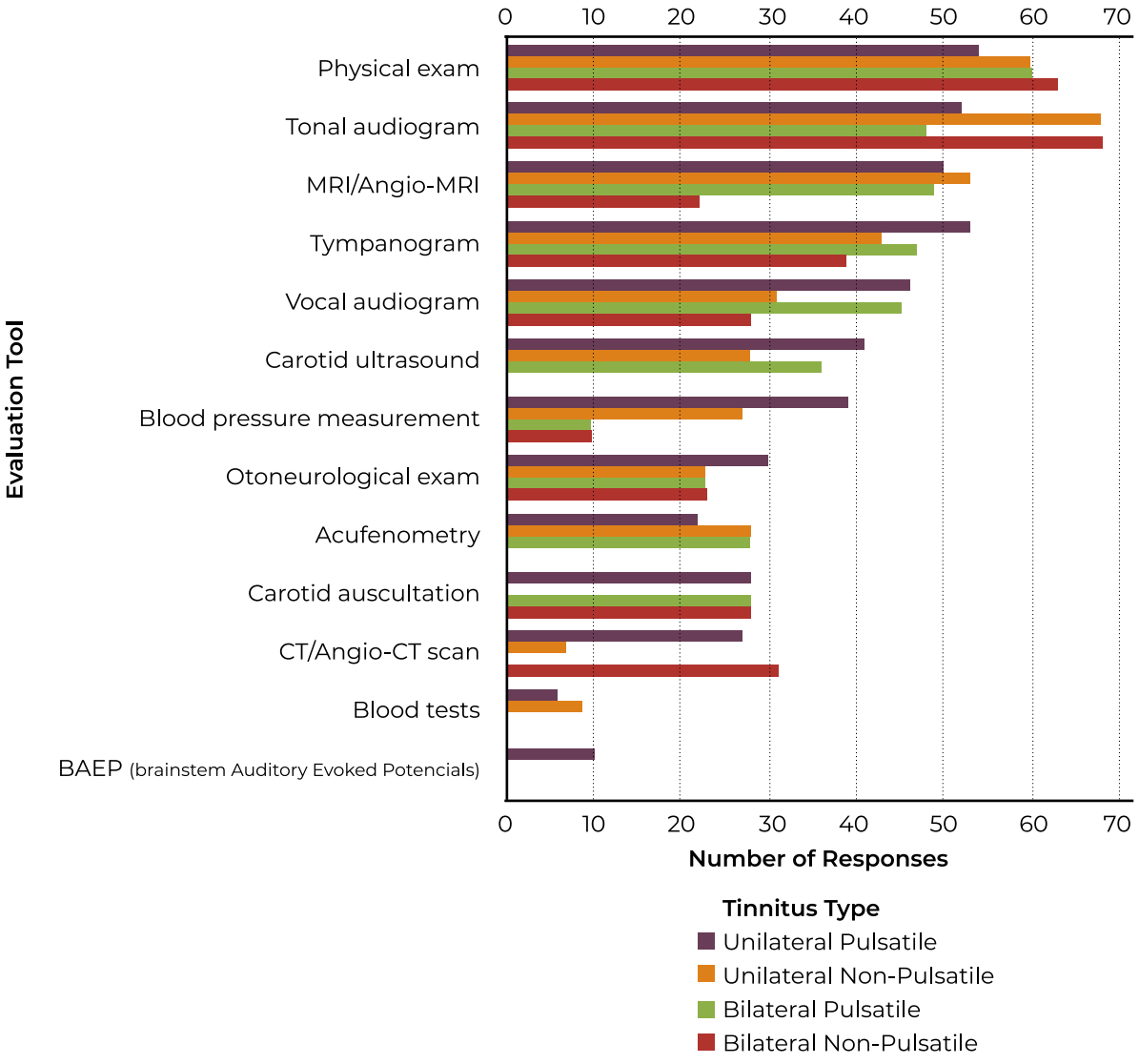


Table 2
Reported most used treatments for patients with tinnitus

Treatment	n (%)
CBT	36 (48%)
Hearing aids	34 (45.3%)
Tinnitus retraining therapy	30 (40%)
Sound generators	21 (28%)
Supplements	45 (60%)
Medication (any)	27 (36%)

Discussion

This study reveals highly heterogeneous clinical practice in the management of tinnitus in Portugal, consistent with European data. Most clinicians adhere to the stipulated consultation time (20 minutes for Otolaryngology in Portugal, according to the Portuguese Medical Association[12]). The majority (92%) of responders work in centres that don't offer a specialized tinnitus appointment, which decreases the chances of a multidisciplinary approach.

The low use of questionnaires (THI) contrasts with international recommendations and limits the ability to monitor quality of life impact. Even though the percentage of respondents who say they use questionnaires to evaluate the daily impact of tinnitus on their patients' lives is greater in those who previously reported that they work in a centre where there is a specialized tinnitus appointment (92,9% vs 80%), this difference isn't statistically significant (p=0,306).

A significant comorbidity for patients with tinnitus, assumed in our questionaire, is hearing loss or a hearing-related disorder[13]. A high burden of psychiatric and cardiovascular comorbidities was observed, reinforcing the need for a multidisciplinary approach. It is often hard to distinguish pre-existent anxiety/depression from the distress triggered by the tinnitus[14]; however psychological distress is an important and well-established factor for the chronification of the tinnitus[15], as is sleep deprivation[16]. While a recent population-based study casts doubts on the strength of the association between cardiovascular disease and tinnitus[17], other works have shown otherwise[18,19]. Nonetheless, studies investigating associations between cardiovascular diseases and tinnitus are lacking. The same applies to the relation between type 2 diabetes mellitus and tinnitus. It has been postulated that hyperglycemia can damage the neuronal cells by impairing vasodilation in the microvascular circulation system of the inner ear and, thus, causing or increasing tinnitus [20]; however, more evidence must be found before a real cause-effect relation can be established. Tinnitus has been identified as an independent risk factor for both dementia and Parkinson's disease[21]. Similarly, there is increasing evidence of associations between TMJ disorders and tinnitus[22]. Our sample showed an emphasis on audiological and tympanometry testing, as well as objective examination, common in the evaluation of all four types of tinnitus. The tonal audiogram is the most valued tool in the evaluation of non-pulsatile tinnitus. The respondents also value the evaluation of blood pressure and the auscultation of the carotid arteries in pulsatile forms of tinnitus (36% and 52% for unilateral and bilateral pulsatile tinnitus, respectively). The unilateral pulsatile form of tinnitus tends to be preferably evaluated with magnetic resonance imaging (MRI) (70,7%). The bilateral pulsatile form is more often evaluated with the use of carotid ultrasound (48%) and angio-MRI (65,3%). In turn, the evaluation of the bilateral non-pulsatile form tends to resort less often to the use of image techniques (MRI/angio-MRI, 29,3%). Most (92%) agree on the need for tympanometry of unilateral pulsatile tinnitus, (89,3%) for unilateral non-pulsatile tinnitus, (92%) for bilateral pulsatile tinnitus and (80%) for bilateral non-pulsatile tinnitus. While there is agreement on the need for audiological testing on all patients presenting with chronic tinnitus, including tympanometry, there is a lack of studies regarding its specificity and sensibility. The imaging exams of choice for our sample are largely consistent with the recommendations outlined in current guidelines, although there appears to be an excessive reliance on Doppler ultrasound, possibly due to limited accessibility to MRI and angiographic exams in routine practice.

Most respondents opt for the prescription of cognitive behavioral therapy (48%), hearing aids [when associated with hearing loss] (45,3%), tinnitus retraining therapy (40%), sound generators (28%), relaxation techniques (37,3%) and supplements (20%). The majority chooses not to prescribe medications to their patients (64%). The most used categories of drugs are anxiolytics, antidepressants, vasodilators and intratympanic injections of corticosteroids. There are currently no Federal Drugs Administration (FDA)- or European Medicines Agency (EMEA)-approved drugs for the treatment of tinnitus[23], and the use of medication tends to be reserved to patients with comorbidities, such as anxiety, insomnia and depression. Current guidelines emphasize non-pharmacological treatments, especially cognitive behavioural therapy and hearing aid evaluation, as first-line management for

chronic tinnitus[24]. We observed a widespread use of gingko biloba-based supplements and a substantial proportion of respondents who prescribe melatonin and vitamins, but also a significative proportion of surveyed who don't prescribe any kind of supplements for their patients. The frequent prescription of supplements, despite the lack of robust evidence, suggests both the absence of effective alternatives and clinical frustration. Both European[25] and Japanese[26] guidelines provide no recommendations for or against dietary supplements. Overall satisfaction among physicians was very low, both regarding available treatment options and the state of research, underscoring significant gaps in innovation and institutional support. While research on healthcare practitioners' satisfaction with tinnitus treatments is scarse, some studies relate a significant mismatch between healthcare practitioners and patients, regarding the satisfaction with the tinnitus treatment offered- clinicians tend to evaluate the treatment higher than their patients[27,28]. We didn't see that mismatch in our sample (p=0,24). These numbers are like those reported in the current literature. A recent survey estimates that two-thirds (64.1%) of patients were dissatisfied with the manner their first tinnitus diagnosis was communicated, and 56.5% rated poorly their first tinnitus treatment[29]. Most respondents considered the implementation of multidisciplinary tinnitus clinics to be a priority, especially with the inclusion of Psychiatry, Neurology and Psychology. These clinics facilitate collaboration between different specialties and other healthcare professionals, optimizing outcomes for complex cases [30,31]. Such model aligns with international studies that have demonstrated improved clinical outcomes and higher patient satisfaction – a recent meta-review reinforced the role of a specialized tinnitus clinical setting- which our clinical framework lacks- in increasing the satisfaction of patients regarding their treatment[33].

Conclusions

Efforts should be made to standardize diagnostic/therapeutic approaches and quantify the daily impact of tinnitus. The lack of specialized consultations in most centres limits further differentiation, which may compromise overall satisfaction outcomes, both in terms of therapeutic management and research. Better outcomes could be achieved through the adoption of multidisciplinary consultations and investment in research and development of treatments for this symptom.

We, the authors, declare no potential sources of conflict of interest.

This article authors declare no external sources of financial support or funding.

All authors contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

References

1. Ellis S, Wilson R, Dolan S. Tinnitus: systematic approach to primary care assessment and management. Br J Gen Pract. 2022 Mar 31;72(717):190-192. doi: 10.3399/bjgp22X719057.

2. Biswas R, Lugo A, Akeroyd MA, Schlee W, Gallus S, Hall DA. Tinnitus prevalence in Europe: a multi-country cross-sectional population study. Lancet Reg Health Eur. 2021 Nov 4:12:100250. doi: 10.1016/j.lanepe.2021.100250.

3. Jarach CM, Lugo A, Scala M, van den Brandt PA, Cederroth CR, Odone A. et al. Global prevalence and incidence of tinnitus: a systematic review and meta-analysis. JAMA Neurol. 2022 Sep 1;79(9):888-900. doi: 10.1001/jamaneurol.2022.2189.

4. 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. doi: 10.1016/j.heares.2016.05.009.

5. Jacobson GP, McCaslin DL. A search for evidence of a direct relationship between tinnitus and suicide. J Am Acad Audiol. 2001 Nov-Dec;12(10):493-6.

6. Trochidis I, Lugo A, Borroni E, Cederroth CR, Cima R, Kikidis D. et al. Systematic review on healthcare and societal costs of tinnitus. Int J Environ Res Public Health. 2021 Jun 26;18(13):6881. doi: 10.3390/ijerph18136881.

7. Parra PC. Tinnitus: mechanisms, measures and sound treatments. Loquens. 2015; 2(2): e024. doi.org/10.3989/loquens.2015.024

8. Langguth B, de Ridder D, Schlee W, Kleinjung T. Tinnitus: clinical Insights in its pathophysiology-a perspective. J Assoc Res Otolaryngol. 2024 Jun;25(3):249-258. doi:

10.1007/s10162-024-00939-0.
9. Fuller TE, Haider HF, Kikidis D, Lapira A, Mazurek B, Norena A. et al. Different teams, same conclusions? A systematic review of existing clinical guidelines for the assessment and treatment of tinnitus in adults. Front Psychol. 2017 Feb 22:8:206. doi: 10.3389/fpsyg.2017.00206.
10. Cima RFF, Kikidis D, Mazurek B, Haider H, Cederroth CR, Norena A. et al. Tinnitus healthcare: a survey revealing extensive variation in opinion and practices across Europe. BMJ Open. 2020 Jan 21;10(1):e029346. doi: 10.1136/bmjopen-2019-029346.
11. Newman CW, Jacobson GP, Spitzer JB. Development of the tinnitus handicap inventory. Arch Otolaryngol Head Neck Surg. 1996 Feb;122(2):143-8. doi: 10.1001/archotol.1996.01890140029007.
12. Portugal. Regulamento n.º 724/2019, de 17 de setembro da Ordem dos Médicos. Diário da República n.º 178 (Série II), 103-118
13. Mazurek B, Böcking B, Dobel C, Rose M, Brüggemann P. Tinnitus and influencing comorbidities. Laryngorhinootologie. 2023 May;102(S 01):S50-S58. doi: 10.1055/a-1950-6149.
14. Gomaa MA, Elmagd MH, Elbadry MM, Kader RM. Depression, anxiety and stress scale in patients with tinnitus and hearing loss. Eur Arch Otorhinolaryngol. 2014 Aug;271(8):2177-84. doi: 10.1007/s00405-013-2715-6.
15. Trevis KJ, McLachlan NM, Wilson SJ. Psychological mediators of chronic tinnitus: The critical role of depression. J Affect Disord. 2016 Nov 1:204:234-40. doi: 10.1016/j.jad.2016.06.055.
16. Asnis GM, Majeed K, Henderson MA, Sylvester C, Thomas M, La Garza RD. An examination of the relationship between insomnia and tinnitus: a review and recommendations. Clinical Medicine Insights: Psychiatry. 2018;9. doi:10.1177/1179557318781078
17. Ausland JH, Engdahl B, Oftedal B, Hopstock LA, Johnsen M, Krog NH. Tinnitus and cardiovascular disease: the population-based Tromsø Study (2015–2016). BMJ Public Health. 2024 Aug 3;2(2):e000621. doi: 10.1136/bmjph-2023-000621.
18. Zhang YP, Gao QY, Gao JW, Liang XT, Guo DC, Chen ZT. et al. The association between tinnitus and risk of cardiovascular events and all-cause mortality: insight from the UK Biobank. Acta Cardiol. 2024 May;79(3):374-382. doi: 10.1080/00015385.2024.2324222.
19. Figueiredo RR, Azevedo AA, Penido NO. Positive association between tinnitus and arterial hypertension. Front Neurol. 2016 Oct 5:7:171. doi: 10.3389/fneur.2016.00171
20. Xia W, Cui J, Luo Y, Xu JJ, Chen H, Yin X. et al. Glucose control has an impact on cerebral blood flow alterations in chronic tinnitus patients. Front Neurosci. 2021 Feb 4:14:623520. doi: 10.3389/fnins.2020.623520.
21. Chu HT, Liang CS, Yeh TC, Hu LY, Yang AC, Tsai SJ. et al. Tinnitus and risk of Alzheimer's and Parkinson's disease: a retrospective nationwide population-based cohort study. Sci Rep. 2020 Jul 22;10(1):12134. doi: 10.1038/s41598-020-69243-0.
22. Edvall NK, Gunan E, Genitsaridi E, Lazar A, Mehraei G, Billing M. et al. Impact of temporomandibular joint complaints on tinnitus-related distress. Front Neurosci. 2019 Aug 22:13:879. doi: 10.3389/fnins.2019.00879.
23. Langguth B, Salvi R, Elgoyhen AB. Emerging pharmacotherapy of tinnitus. Expert Opin Emerg Drugs. 2009 Dec;14(4):687-702. doi: 10.1517/14728210903206975.
24. Tunkel DE, Bauer CA, Sun GH, Rosenfeld RM, Chandrasekhar SS, Cunningham ER Jr. et al. Clinical practice guideline: tinnitus. Otolaryngol Head Neck Surg. 2014 Oct;151(2 Suppl):S1-S40. doi: 10.1177/0194599814545325.
25. 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. doi: 10.1007/s00106-019-0633-7.
26. Ogawa K, Sato H, Takahashi M, Wada T, Naito Y, Kawase T. et al. Clinical practice guidelines for diagnosis and treatment of chronic tinnitus in Japan. Auris Nasus Larynx. 2020 Feb;47(1):1-6. doi: 10.1016/j.anl.2019.09.007.
27. Steinmetzger K, Schiele T, Boecking B, Avraamides M, Bamidis PD, Basso L. et al. A survey-based assessment of attitudes and needs regarding tinnitus healthcare among patients and healthcare professionals in Europe. Frontiers in Audiology and Otology [Online], 2024; 2. Available from: https://doi.org/10.3389/fauot.2024.1347283
28. 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):313-336. doi: 10.3766/jaaa.16154.
29. Carmody N, Hunter M, Eikelboom RH. Help-seeker satisfaction with diagnosis and treatment of tinnitus. Int J Audiol. 2024 Dec;63(12):1019-1026. doi: 10.1080/14992027.2023.2292964.
30. Hall DA, Fackrell K, Li AB, Thavayogan R, Smith S, Kennedy V. et al. A narrative synthesis of research evidence for tinnitus-related complaints as reported by patients and their significant others. Health Qual Life Outcomes. 2018 Apr 11;16(1):61. doi: 10.1186/s12955-018-0888-9.
31. Ivansic D, Dobel C, Volk GF, Reinhardt D, Müller B, Smolenski UC. et al. Results of an interdisciplinary day care approach for chronic tinnitus treatment: a prospective study introducing the Jena interdisciplinary treatment for tinnitus. Front Aging Neurosci. 2017 Jun 16:9:192. doi: 10.3389/fnagi.2017.00192.
33. Carmody N, Eikelboom RH, Tegg-Quinn S. Seeking help for tinnitus and satisfaction with healthcare providers including diagnosis, clinical services, and treatment: a scoping review. Eval Health Prof. 2023 Jun;46(2):170-193. doi: 10.1177/01632787231158402.