

Scientific research about tinnitus in Brazil: An observational compilation

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ABSTRACT

Purpose: to identify the profile of tinnitus research in Brazil and the main procedures adopted by professionals in the field in the national territory.

Methods: an observational, descriptive, and cross-sectional study, in which an active search was made on digital platforms to identify researchers in Brazil who have tinnitus as a study focus. After identifying the tinnitus study groups, an online Form was sent to the researchers comprising 21 questions, so as to know the works in development. The collected responses were extracted and tabulated into Microsoft Excel Professional Plus 2019 through the absolute and relative frequency measurements of the final sample.

Results: 117 researchers were identified, of these, 21 participated in the study, being (90.5%) females, specifically from public universities (81%) in the Southeast region of Brazil (47.7%). These professionals develop clinical research (76.1%), focusing on therapies and/or treatments (38.1%), and use sound therapy (52.38%) as the main technological resource of their studies.

Conclusion: the research profile is clinical, with a main focus on therapies and/or treatments for tinnitus. As for the procedures, there is a predominant application of the Visual Analogue Scale- VAS and the Tinnitus Handicap Inventory- THI as evaluation protocols and sound therapy as the main technological resource of their studies.

Descriptors: Tinnitus; Research; Audiology; Interdisciplinary Research; Health; Science

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INTRODUCTION

Tinnitus is defined as a conscious sensory perception of a sound that is not linked to a corresponding external sound source. Tinnitus disorder refers to tinnitus associated with emotional distress and functional disability¹. Currently, it is understood that the symptom occurs in multiple neural substrates resulting from a stimulus at the peripheral, central level, or both, which trigger different effects on sensory receptors².

In this sense, tinnitus has awakened the attention of researchers due to the complexity of the symptom, which appears to have different inducing agents involved in the body's systems, characterizing it as a multifactorial symptom³. It can interfere with the quality of life, impacting sleep quality, concentration, and social interaction and resulting in increased rates of psychiatric comorbidities⁴.

Therefore, in a global panorama, it is estimated that approximately 10% to 15% of the adult population experiences persistent tinnitus associated or not with hearing impairment concomitantly. It is believed that this prevalence of tinnitus is linked to the characteristics of hearing loss, such as the level of severity and frequency impaired by hearing deficit⁵.

A pioneering study conducted in Europe identified that 14.7% of adult subjects reported having some type of tinnitus. The sample of this research stands out due to its composition which consists of population representations by 12 member countries of the European Union (EU). The strategic choice of these countries is mainly due to the representativeness of the socio-cultural and economic diversity of the European bloc⁶. In the Brazilian scenario, a single epidemiological study published to date identified a prevalence of the complaint of approximately 22% in the city of São Paulo⁷. To date, there is no study available in the literature that demonstrates national prevalence.

It is worth highlighting that the estimates available in the literature on tinnitus already demonstrate the potential problems that may arise as a result of this symptom. With increasing life expectancy and the elderly population⁸, it is assumed that tinnitus-related indices are expected to follow the same growth pattern in the coming decades. In addition, knowing what has been researched about tinnitus allows prioritizing and directing research on this topic, to enhance effective forms of evaluation and highlight new treatment strategies at the national level.

Thus, despite the large number of individuals with tinnitus, there is no gold standard available for the

treatment of the symptom due to its etiological heterogeneity⁹. Therefore, it is essential to encourage research on this topic to elucidate initial pathophysiological issues, thus enabling greater assertiveness in future research related to treatment strategies and modalities or even, in some cases, complete remission¹⁰.

As a result, the present study aims to identify the profile of tinnitus research in Brazil and the main procedures adopted by professionals in the area in the national territory, clarifying what, how, where, and who has researched the symptoms in Brazil.

METHODS

Study design

The design research was conducted according to the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE). Consequently, this work is an observational, descriptive, and cross-sectional study, approved by the Research Ethics Committee of the Universidade Federal da Paraíba - UFPB, Brazil, under the opinion number 5,328,932 (CAAE 54339921.8.0000.5188). All participants were informed about the research and invited to sign the Informed Consent Form (ICF).

Scenario

The study was carried out online and this modality was established due to the magnitude of the national territory, which required the use of a tool that reached the different regions of Brazil in the period from August 2021 to December 2022. For this, digital platform tools were used via the internet to contact research groups, universities, and tinnitus researchers, having as the main tool, e-mail.

Participants

Researchers, teachers, health professionals, university employees, and research groups that study tinnitus were included and fit the following eligibility criteria: be registered in the electronic pages that promote research in Brazil and have developed research on tinnitus in the last 10 years. Research groups/ researchers whose status as registered in the directory was not active, as well as research not directly and/or indirectly related to the health area were not accepted.

The initial data collection took place through active search in digital platforms, such as the *Conselho*

Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Diretório dos Grupos de Pesquisa no Brasil (DGPs/CNPQ), the professional social network LinkedIn and the social network ResearchGate. When the researcher's contact was not provided, the corresponding scientific production was analyzed to find electronic addresses available to contact the professional or the research institution.

After obtaining the contact of these professionals, an e-mail inviting the researcher to contribute by answering an online questionnaire structured through Google Forms was sent, which link was highlighted.

Thereby, the questionnaire was sent to all researchers who were found on digital platforms. This questionnaire contained the Informed Consent Form-ICF and 21 standardized objective questions (Figure 1), developed to identify the researcher, the research, and protocols on tinnitus.

The questions developed were based on the expertise of three tinnitus researchers and a fourth professional who ratified them, therefore, the collection questionnaire is unprecedented and authored by the collaborators of this work.

Collection questionnaire

-1- What type of research do you work with?
a) Animal research c) Computer simulations e) Other:
b) In vitro research d) Clinical research

-1.2- The main focus of your research is mainly on:
a) Experimental research on tinnitus d) Occupational tinnitus
b) Therapies and/or treatments e) Prevention
c) Tinnitus assessment methods f) Other:

1.3- Are any of these options part of your research?
a) Acupuncture o) Hormonal Modulation
b) Auriculotherapy p) Somatosensory therapy
c) Sound Therapy q) Cervicalgia
d) Laser therapy r) TMD
e) Neurolinguistic Programming s) Pain
f) Medications/drug studies t) PSADs and/or CI
g) Vitamin supplementation u) Internet
h) Electrical stimulation v) Remission
i) Magnetic stimulation w) Others:
j) Mindfulness
k) Different types of physical practice
l) Cognitive Behavioral Therapy – CBT
m) Stimulation of the vagus nerve and/or trigeminal nerve
n) Electroencephalography/Magnetoencephalography/Magnetic Resonance Imaging

-2- The institution where your research is concentrated is:
a) Public b) Private c) Other:

-3- In which macro-region of Brazil is your research institution located?
a) North c) Midwest e) Southeast
b) Northeast d) South

-4- Does the research have an international partnership?
a) Yes b) No c) Other:

-5- Is the research linked to any Stricto Sensu orientation program and/or scientific initiation project?
a) Yes b) No c) Other:

-5.2- If you answered "YES" to the previous question, your research is linked to:
a) Master's programs f) Master's and doctoral programs
b) Doctoral programs g) All
c) Scientific initiation programs h) Other;
d) Master's and PhD
e) Answer to the previous question was "No"

-6- Does the research provide any outpatient services to the public?
a) Yes b) No c) Other:

-6.2- If your answer was "YES" to the previous question, is the outpatient service?
a) Private b) Public c) Other:

-7- If you have outpatient care, do you believe that patients can access the service easily?
a) Yes b) No c) Other:

-8- Volunteers can access their research through:
a) Social networks c) Telephone appointment d) Other:
b) Face-to-face appointment at the research institution

-9- Do you believe that volunteers can find your research easily?
a) Yes b) No c) Other:

-10- Do your tinnitus surveys suffer from significant sample losses?
a) Yes b) No c) Other:

-11- The majority of your volunteers are aged between:
a) 08 to 12 years old d) 30 to 50 years old g) Other:
b) 12 to 18 years old e) 50 to 70 years old
c) 18 to 30 years old f) 70 to 85 years old

-12- Do you use any of these protocols/resources/tests in your research? If so, which ones?
a) THI c) TFI e) Acuphenometry
b) VAS d) TRQ f) Others:

13- Do you use any of your own protocols?
a) Yes b) No c) Other:

14- Which professionals are involved in your research?
a) Dentist g) Otolaryngologist
b) Nurse h) Psychologist
c) Speech therapist i) Psychiatrist
d) Physical therapist j) Occupational Therapist
e) Neurologist k) Others:
f) Nutritionist

-15- From your perspective, is multidisciplinary work important to help tinnitus patients?
a) Yes b) No c) Other:

-16- Are you able to contact colleagues in the research field to form new partnerships?
a) Yes b) No c) Other:

-17- How long have you been interested in studying tinnitus?
a) Less than a year c) Between five and ten years
b) Between one and five years d) More than ten years
e) Other:

-18- Are you currently involved in more than one research project on tinnitus?
a) Yes b) No c) Other:

-19- Studying tinnitus in Brazil is:
a) Challenging
b) Normal
c) The same level of difficulty as other research.
d) Other:

-20- From your perspective, national research on tinnitus is of high quality:
a) High/ Optimal
b) Average/Reasonable
c) Low/Could be improved
d) Other:

-21- Do you believe that there are unexplored areas of tinnitus research in Brazil?
a) Yes b) No c) Other:

Questionnaire developed for the study "Scientific research about tinnitus in Brazil: an observational compilation"

Captions: CBT= Cognitive Behavioral Therapy; PSADs = Personal Sound Amplification Device; CI = Cochlear Implant; TMD = Temporomandibular Dysfunction; THI = Tinnitus Handicap Inventory; TFI = Tinnitus Functional Index; VAS = Visual Analogue Scale; TRQ = Tinnitus Reaction Questionnaire..

Figure 1. Collection questionnaire

Variables

The pertinent responses to the collection instrument were stored and tabulated in program spreadsheets Microsoft Excel Professional Plus 2019 for descriptive analysis purposes. Absolute and relative frequency measurements were extracted to describe the sociodemographic profile of the researchers who constituted the sample, as well as to associate the different variables that consisted from the training of professionals to the macro-regions where research on tinnitus in Brazil is concentrated

The variables analyzed were: postgraduate orientation and scientific initiation, research instruments and tools, prevalence of age more stipulated by the researchers in their sample group, offer of outpatient care, means of access to research, sociodemographic data of the researchers related to sex, age, area of training, area of activity and macro-region of Brazil.

Study size

Lastly, the difference in the size of the population and final sample is due to the type of sampling defined, in which all professionals who answered the questionnaire were included. Although this circumstance is a limiting factor of the study, the analysis employed follows the guidelines pre-established by the Strobe, characterizing the research modalities, the professionals, and the structures elected by them for the execution of the studies.

RESULTS

Descriptive Data

The active search on digital platforms identified a total of 117 tinnitus researchers in the national territory. The final sample was 21 individuals who agreed to participate in the research. Regarding academic training, there was a predominance of speech therapists (61.9%) and otorhinolaryngologists (28.5%). The sociodemographic data of the researchers are distributed in Table 1.

Table 1. Socio-demographic data for initial characterization of the sample

Variables	(n = 21)	(%)
Sex		
Females	19	90.5%
Males	2	9.5%
Age		
30 40 years	5	23.8%
41 50 years	7	33.4%
51 60 years	8	38.0%
61 70 years	0	0%
71 80 years	1	4.8%
Education		
Speech therapist	13	61.9%
Physical therapist	1	4.8%
Otolaryngologist	6	28.5%
Biomed	1	4.8%

Captions: n = Number of researchers; % = Percentage of researchers.

Major results

The data regarding the current development of tinnitus research are presented in Table 2. The predominant region that researches this theme is the Southeast (47.7%). As for the international partnership (23.8%), a link was identified with two American, two English, and one Swedish university.

As expected, the institutions associated with tinnitus studies were mainly of public initiative (81%), which developed clinical research with a main focus on therapies and/or treatments. Thus, most of the search offer outpatient care open to the public (57.1%), because they need volunteers in the investigation of

treatments. As a form of tinnitus assessment, the instruments and resources that stood out were the Visual Analogue Scale - VAS (81%) and Tinnitus Handicap Inventory-THI (71,4%).

Regarding multi-disciplinarity, Table 3 shows that all researchers considered intellectual diversity relevant in conducting the studies, without greater difficulties in contacting colleagues in the field (81%).

Table 2. Data on tinnitus research in progress

Variables	(n = 21)	(%)
Types of study		
Animals research	1	4.8%
In vitro research	0	0%
Clinical research	16	76.1%
Translation and adaptation of protocols	1	4.8%
Others	3	14.3%
Focus of study		
Experimental studies	1	4.8%
Therapies and/or Treatments	8	38.1%
Prevention	2	9.5%
Tinnitus assessment methods	8	38.1%
Others	2	9.5%
Research institution		
Private initiative	4	19%
Public initiatives	17	81%
Research macro-region		
North	0	0%
Northeast	5	23.8%
Midwest	2	9.5%
Southeast	10	47.7%
South	4	19%
International partnership		
Yes	5	23.8%
No	16	76.2%
Outpatient care		
Yes	12	57.1%
No	8	38.1%
Others	1	4.8%
Sample group age		
18 – 30 years	3	14.3%
30 – 50 years	6	28.6%
50 – 70 years	8	38.1%
70 – 85 years	0	0%
Others	4	19%
Evaluation Instrument		
THI	15	71.4%
VAS	17	81%
TFI	3	14.3%
Acuphenometry	12	57.1%
Others	3	14.3%
Currently conducting more than one tinnitus survey		
Yes	12	57.1%
No	9	42.9%

Captions: THI = Tinnitus Handicap Inventory; VAS = Visual Analogue Scale; TFI = Tinnitus Functional Index; n = Number of researchers; % = Percentage of researchers.

Also in Table 3, regarding the category of professionals that make up the research teams, there was a predominance of speech-language pathologists

(90.5%) and otolaryngologists (81%), with a diverse distribution of the other categories.

Table 3. Data on multi-disciplinarity in research

Variables	(n=21)	(%)
Professionals making up the research team		
Dentist	3	14.3%
Nurse	5	23.8%
Speech therapist	19	90.5%
Physical therapist	4	19%
Neurologist	1	4.8%
Nutritionist	2	9.5%
Otolaryngologists	17	81%
Psychologist	3	14.3%
Psychiatrist	1	4.8%
Radiologist	2	9.5%
Pharmacist	1	4.8%
General Physician	2	9.5%
Importance of multi-disciplinarity in research		
Yes	21	100%
No	0	0%
Others	0	0%
Easy to contact colleagues in the industry for new partnerships		
Yes	17	81%
No	3	14.2%
Others	1	4.8%

Captions: n = Number of researchers; % = Percentage of researchers.

In Table 4, the data demonstrate the perspectives that the researchers have regarding the development of studies on tinnitus in Brazil. Evidencing that more than half have studied the subject for approximately 10 years

or more (61.9%), they consider it challenging to develop research on the subject in the national territory (57.1%), as well as claiming that national tinnitus research has an average level of quality (81%).

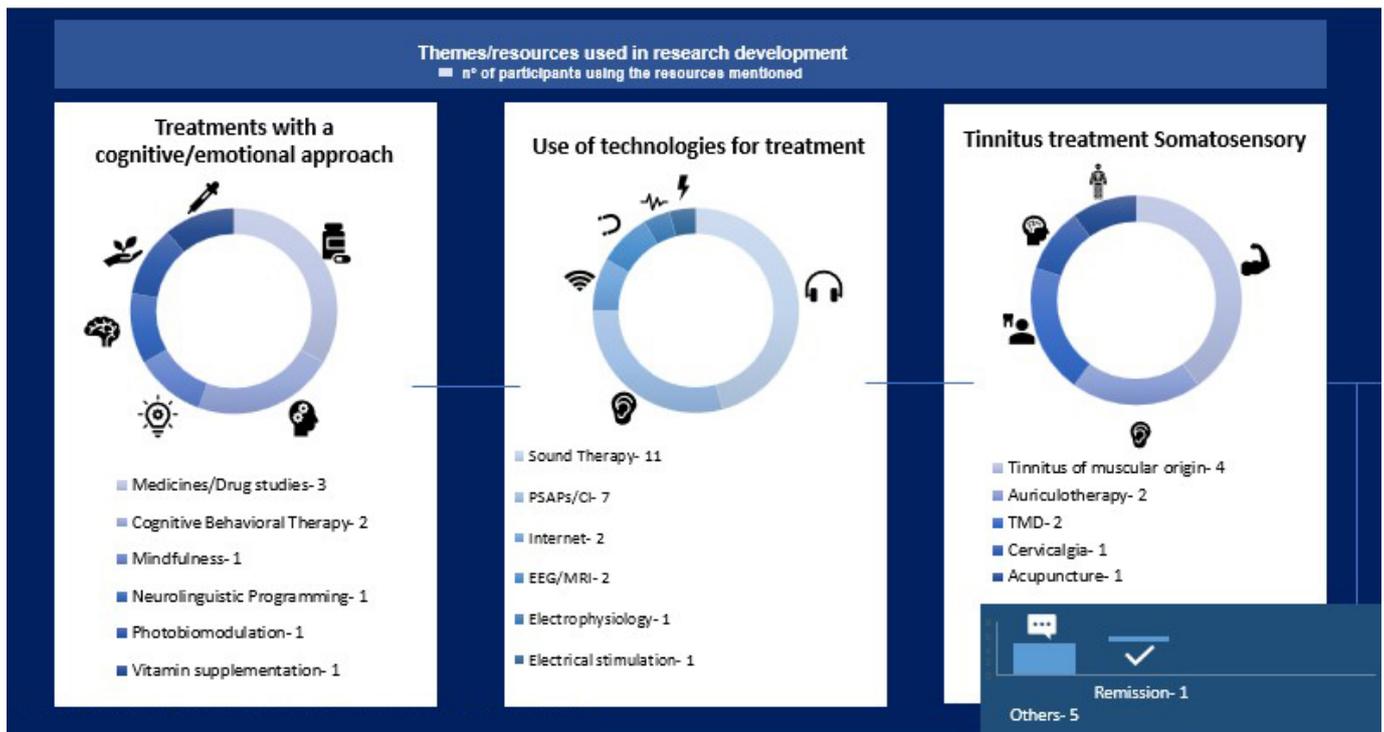
Table 4. Data on researchers' perspectives on the development of tinnitus research

Variables	(n= 21)	(%)
Years of study on the topic		
< 1 year	0	0%
1 – 5 years	2	9.5%
5 – 10 years	6	28.6%
> 10 years	13	61.9%
Level of difficulty in conducting the study		
Challenger	12	57.1%
Normal	1	4.8%
Good	1	4.8%
The same as the other themes	7	33.3%
Quality level of national research		
High	2	9.5%
Medium	17	81%
Low	2	9.5%

Captions: n = Number of researchers; % = Percentage of researchers.

Figure 2 lists the main themes and resources used in the development of tinnitus research, and of the 19

options established, the use of sound therapy (52.38%) prevailed as the most recurrent resource and theme.



Captions: n = Number of researchers; PSADs = Personal Sound Amplification Device; CI = Cochlear Implant; EEG/MRI= Electroencephalography/Magnetic Resonance Imaging; TMD = Temporomandibular Dysfunction.

Figure 2. Disposition of resources and themes implemented in tinnitus research

DISCUSSION

Tinnitus is a symptom of difficult management and with increasing demand in health offices, something that has led professionals from different spheres to study this theme⁶. The results of this work express this reality, considering that the main research is of the clinical type in search of evidence based on therapies.

In addition, there is no consensus in the literature regarding the effectiveness of therapeutic proposals, which present difficulties regarding methodological standardization, due to the complexity of the symptom⁹. For this, it is essential to know what studies are underway and possible research routes to achieve robust evidence that positively impacts the target population. Therefore, key information involved with scientific production/research was compiled.

In this sense, for the characterization of these professionals, according to the results distributed in Chart 1, it was possible to observe the predominance of the sex of the researchers, in which the results are similar to those found in the areas of physical therapist, occupational therapy and nursing^{11,12}, with more female researchers, while cross-sectional studies of Medicine and Dentistry identified a predominance of males^{13,14}.

In addition, it was possible to verify that most of the sample consisted of individuals over the age of 50 years old, something expected, considering all the factors involved in the construction of the teaching and research career¹⁴. There is also the presence of younger researchers, giving indications of career appreciation and the awakening of students to set professional goals while still in graduation, in addition to the thematic choice of tinnitus, an area on the rise that has attracted the attention of this generation as a research focus.

About the initial academic training of these researchers, there was a predominance of speech-language pathologists, followed by otolaryngologists, something that is directly consistent with the scientific literature on tinnitus, since much of the conduct of these studies is led by these professionals. These professions are also seen as the first to be consulted, since it is an auditory symptom or correlated with hearing, even though different professionals work in the treatment of tinnitus¹⁵.

In terms of location, the Southeast was the macro-region of Brazil responsible for almost half of the tinnitus research in development. This scenario is consistent with the predominance of Health postgraduate degrees in this region and the universities with the highest

research incentives are located in the same macro-region¹⁶. While, the Northeast is responsible for the second largest number of these studies, standing out from the South and Midwest regions of the country.

As for international partnerships, a small part referred to partnerships, most of them from the Southeast region and only one from the Northeast. The encouragement of this practice is of paramount importance for the growth of multicenter studies, training abroad, and implementation of new services and technologies, in addition to the promotion of doctoral sandwich notices¹⁷.

In addition, the research institutions responsible for these ongoing studies are predominantly public initiatives. This is because large research centers receive support from funding agencies, determining public policies, as well as encouraging undergraduate students to get involved with extension and research projects as soon as possible¹⁸.

Of these tinnitus studies, most fit as clinical type, with predominance for this modality when compared with the others. Other research uses animals and the minority is research related to the translation and adaptation of protocols. A relevant part of the researchers reported developing research of another type but did not report the modality and no researcher developed tinnitus studies as the main modality *In Vitro*.

In this sense, there is an important scientific production on tinnitus in the national territory, thus demanding a direction of what there is already evidence and what gaps to be unraveled, allowing professionals to prioritize in their research aspects little explored in the theme, that is, it is necessary to invest in basic research focused on tinnitus.

This is because basic research allows the elaboration of new concepts on topics already studied, thus, it is assumed that basic research could bring new perspectives about the pathophysiological mechanisms of tinnitus, and different factors involved with the symptom and, consequently, collaborate with the development of new treatments related to the theme.

Regarding epidemiological studies, no research record of this nature was identified in development that includes different Brazilian states. Therefore, it is appropriate to mention that these data could be used to provide up-to-date data at national and global levels. These estimates are important for setting intervention priorities and selecting strategies for monitoring health programs at the international level through data collaboration¹⁹.

Therefore, the combination of studies *in vitro*, animal studies, genetic studies, and studies with nanotechnologies is interesting, considering that the combination between them is intended to increase the possibilities of answering elementary questions of tinnitus. Therefore, they would point out which studies would be viable to be replicated with humans and would indicate which divergent factors for tinnitus are still at the molecular level. In addition, it would provide subsidies for translational research, since they aim to combine knowledge from basic and clinical research to improve the applicability of new therapeutic concepts and technologies²⁰.

It is also noted that the research that made up the sample had as its main focus therapies and/or treatments and evaluative methods of tinnitus, something that demonstrates the researchers' focus on improving their methods simultaneously and combined, to achieve better results for this population. In addition, experimental studies are related to the identification of tinnitus biomarkers²¹. A portion of the research focuses on the prevention of the symptom, something positive, considering that prevention can be implemented at the community level and can avoid burdens associated with tinnitus.

Given this, several therapeutic resources have been seen in tinnitus research, with an emphasis on sound therapy, since it was a common element in more than half of the tinnitus research in development. The high demand is due to the low side effects and potential complementary therapeutic resources. Soon after, the Personal Sound Amplification Device (PSAPs) and/or cochlear implant (CI) associated with tinnitus were study items in different studies of this sample, because they are technologies that not only stimulate hearing but also can stimulate the auditory cortex and lead to reductions in neural activity associated with the symptom²².

Studies related to somatosensory tinnitus have gained space due to its complexity related to the activation of the somatomotor, visomotor, and somatosensory systems. Thus, there is a relevant number of ongoing research in Brazil involved with this theme, indicating the importance of inserting somatic tests in tinnitus assessments²³. In addition, research focusing on Temporomandibular Dysfunction (TMD), cervicalgia, acupuncture, and auriculotherapy was also identified.

In this sample, there were also studies dedicated to medications for tinnitus, which seek pharmacological approaches capable of modulating the functions of ion channels and neural receptors related to tinnitus,

minimizing adverse effects, such as low biocompatibility and dependence on medication²⁴. In addition, we seek to understand the influence of oxidative stress on tinnitus and the benefits of vitamin supplementation in this process²⁵, and a single national study in development focuses on this theme.

In addition to the approaches discussed above, different themes make up the tinnitus research of this sample, such as tinnitus and Internet, mindfulness, Cognitive Behavioral Therapy (CBT), and Neuro-Linguistic Programming. The use of these techniques associated with tinnitus aims to promote the self-management of the symptom, online or face-to-face. The search for evidence of these practices has grown, considering the limited accessibility by some patients in the search for specialists to treat their tinnitus²⁶.

Although some studies have shown that cochlear damage can give rise to neuroplastic changes in parts of the central nervous system, it is investigated whether there is a reorganization of the cortical tonotopic map or an altered functional connectivity, since the differences in the biological composition of the tinnitus and control groups make it difficult to delimit symptom variables². However, research related to the nervous system has been growing²⁷, including in the national scenario, considering that in this sample there were studies associated with the use of electroencephalography/magnetic resonance imaging, electrical stimulation, and photobiomodulation.

To conclude the discussion of the figure referring to themes and resources, the development of studies on tinnitus remission and electrophysiology were also reported, as important topics, but which lack literature¹⁰. Thus, both studies will contribute to the scientific evidence related to the topic.

Just as well-founded therapeutic resources are important for the treatment of tinnitus, evaluation resources are also important, because the evaluation will dictate the best therapeutic paths, in addition to being necessary for records and comparison of evolution. In the composition of this sample, for the evaluation, there was a preference for the use of the Tinnitus Handicap Inventory (THI), Visual Analogue Scale (VAS), Tinnitus Functional Index (TFI), and acuphenometry (or psychoacoustic assessment of tinnitus).

Self-assessment protocols are used to measure aspects of perception about the symptom, while acuphenometry aims to evaluate the psychoacoustics of tinnitus, that is, to identify the type, intensity, and

frequency. Moreover, more than half of the researchers claimed to produce more than one tinnitus study simultaneously, so the same researcher may be developing evidence for evaluation and treatment.

About the provision of outpatient care, most researchers reported providing some type of care for research volunteers. The engagement of society by volunteering for research is a positive gain for both sides, considering that the research applies tests to identify an answer, therefore, it is a noble gesture on the part of the volunteer to consent to go through this process to contribute to a collective good. In addition, the services can offer access to a therapy or technology not yet available on the market, in this way, the volunteer is available to the risks and benefits for a common good²⁸.

As for the age of the volunteers who participated in the tinnitus surveys, most were between 50 and 70 years old, while the minority was between 18 and 30 years old. Some of the tinnitus researchers chose to check the "other" option with the justification of not having the survey of age predominance of the volunteers, since they include individuals over 18 years of age in general and no researcher has invested in studying tinnitus in children and adolescents' group.

It is possible to observe that the group over 50 years of age remains the main affected by tinnitus, substantiating the theory of association between the symptom and the consequent hearing loss due to aging²⁹. However, the number of young people seeking care has also grown, so it is worth investigating the possible factors correlated with this demand, such as early exposure to noise, exposure to industrialized materials/technologies, or if the demand is only associated with increased access to information on this topic³⁰.

In this sense, the search for solutions to tinnitus involves a range of different research professionals, and the composition of this sample demonstrated this. Therefore, this plurality coincides with the affirmation of the researchers about the importance of multi-disciplinarity in tinnitus studies, although a portion indicated some kind of difficulty in contacting colleagues in the research field to make new partnerships.

Finally, it is worth mentioning that the national tinnitus surveys under development are mostly composed of professionals who have been studying the topic for more than 10 years, demonstrating the level of experience and years of dedication to finding answers not yet elucidated about tinnitus. Regarding the level of difficulty in developing tinnitus research, the

researchers' responses were quite divergent, pointing to different perspectives in this regard.

Regarding the quality of national tinnitus surveys, the sample responses are consistent with McCormack's studies et al., 2016¹⁹ and Beukes et al., 2020⁹, which reveal the difficulties of developing studies on the topic, in addition to the heterogeneous complexity of the symptom itself, such as different diagnostic criteria, non-standardization of the evaluation and differences in the analysis of the results. Therefore, the impasses in researching the topic in Brazil are similar to the articles mentioned.

In short, the present study is current and fundamental to map the national research conditions related to the theme, which resemble European circumstances³¹. Soon, with this information, professionals will be able to analyze new possibilities of treatment approaches, systematization of evaluative protocols, personalization of treatments, or even the development of a national guideline on tinnitus³². Thus, it is suggested that future studies increase the sample collection, determine systematized tinnitus evaluation criteria, and prioritize basic studies to unravel initial pathophysiological information. In addition, it would be interesting to form a national guideline, given the heterogeneity of the symptoms and the demographic characteristics of the region.

CONCLUSION

The studies are mostly concentrated in public universities in Southeastern Brazil (47.7%), being conducted by professional speech therapists (61.9%) and otolaryngologists (28.5%), aged between 51 and 60 years (38.0%), 90.5% being females.

There is a predominance (76.1%) of clinical studies with a primary focus on therapies and/or treatments (38.1%). There is also a growing number of studies referring to evaluation protocols (38.1%), something essential for the benefit of patients and the improvement of epidemiological studies of tinnitus. As a form of evaluation, the Visual Analogue Scale (81%) and the questionnaire Tinnitus Handicap Inventory (71.4%) are the main evaluation protocols applied, while sound therapy (52.38%), is the most used technological resource in the studies.

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