



Bibliometric analysis on the voice multidimensional outcomes associated with thyroidectomy in the Brazilian journals of Speech, Language and Hearing Sciences

Análise bibliométrica sobre parâmetros multidimensionais da voz associados à tireoidectomia nos periódicos brasileiros de Fonoaudiologia

Análisis bibliométrico de los parámetros multidimensionales de la voz asociados a la tiroidectomía en revistas brasileñas de Logopedia

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Abstract

Objective: To analyze the profile of scientific production published in Brazilian Speech, Language and Hearing Sciences journals on multidimensional voice parameters associated with thyroidectomy.

Method: Bibliographic review with bibliometric analysis and search made in the databases of four Brazilian journals specialized in Speech, Language and Hearing Sciences, indexed between 2005 and 2019. The descriptors of dysphonia, thyroidectomy and thyroid gland neoplasms were cross-referenced,

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LSL - contributed with the conception, collection, data analysis, writing, critical analysis and final review of the article.

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including original articles, review articles, case studies, short communications and editorial reviews presenting results on perceptive-auditory, acoustic and/or self-evaluation parameters of the voice before or after thyroidectomy. We extracted the geographic region and institution where the study was carried out, the number of institutions involved, the number of authors, the authors' academic degree, the publication periodic, the type of article, the study design, the sample size and the vocal parameters evaluated. **Results:** Five studies were included: two carried out in the Southeast region, two in the Northeast and one in the South; three with inter-institutional partnership; four in which the first author was a speech therapist; speech therapists and physicians with academic degrees from undergraduate to PhD; number of authors between three and seven. Four studies were transversal and approached only vocal self-evaluation. Three studies were published as original articles, one as a brief communication and one as a review. The sample size ranged from 12 to 60 individuals; each journal published at least one article on the subject. **Conclusion:** there is a low scientific production published in Speech, Language and Hearing Sciences journals on multidimensional voice parameters associated with thyroidectomy, since in 15 years, only five studies on the subject have been published.

Keywords: Dysphonia; Voice; Thyroidectomy; Speech, Language and Hearing Sciences; Bibliometrics. Brazil.

Resumo

Objetivo: Analisar o perfil da produção científica publicada nos periódicos brasileiros de Fonoaudiologia sobre parâmetros multidimensionais da voz associados à tireoidectomia. **Método:** revisão bibliográfica com análise bibliométrica e busca realizada nas bases de dados dos quatro periódicos brasileiros especializados em Fonoaudiologia, indexados entre 2005 e 2019. Foram cruzados os descritores disfonia, tireoidectomia e neoplasias da glândula tireoide, sendo incluídos os artigos originais, de revisão, estudos de caso, comunicações breves e resenhas editoriais que apresentassem resultados sobre parâmetros perceptivoauditivos, acústicos e/ou de autoavaliação da voz antes ou após tireoidectomia. Foram extraídas a região e instituição em que o estudo foi realizado, a quantidade de instituições envolvidas, número de autores, grau acadêmico dos autores, periódico de publicação, tipo de artigo, desenho de estudo, tamanho da amostra e parâmetros vocais avaliados. **Resultado:** Foram incluídos cinco estudos: dois realizados na região Sudeste, dois no Nordeste e um no Sul; três com parceria interinstitucional; quatro em que o primeiro autor era fonoaudiólogo; coautores fonoaudiólogos e médicos com grau acadêmico desde graduação até doutorado; número de autores entre três e sete. Quatro estudos foram transversais e abordaram apenas autoavaliação vocal. Três estudos foram publicados como artigos originais, um como comunicação breve e um como resenha. O tamanho amostral oscilou entre 12 e 60 indivíduos; cada periódico publicou, no mínimo, um artigo sobre o tema. **Conclusão:** existe baixa produção científica publicada nos periódicos brasileiros de Fonoaudiologia sobre parâmetros multidimensionais da voz associados à tireoidectomia, já que em 15 anos, foram publicados apenas cinco estudos sobre o tema.

Palavras chave: Disfonia; Voz; Tireoidectomia; Fonoaudiologia; Bibliometria. Brasil.

Resumen

Objetivo: Analizar el perfil de la producción científica publicada en las revistas brasileñas de Logopedia sobre los parámetros multidimensionales de la voz asociados a la tiroidectomía. **Método:** Revisión bibliográfica con análisis bibliométrico y búsqueda en las bases de datos de cuatro revistas brasileñas especializadas en Logopedia, indizadas entre 2005 y 2019. Se hicieron referencias cruzadas de los descriptores de disfonía, tiroidectomía y neoplasias de la glándula tiroideas, incluidos artículos originales, artículos de revisión, estudios de casos, comunicaciones breves y revisiones editoriales que presentaban los resultados sobre parámetros perceptivos-auditivos, acústicos y/o de autoevaluación de la voz antes o después de la tiroidectomía. Se extrajo la región y la institución en la que se realizó el estudio, el número de instituciones involucradas, el número de autores, el grado académico de los autores, la revista de publicación, el tipo de artículo, el diseño del estudio, el tamaño de la muestra y los parámetros vocales evaluados. **Resultados:** Se incluyeron cinco estudios: dos realizados en la región

Sudeste, dos en el Noreste y uno en el Sur; tres con asociación interinstitucional; cuatro en los que el primer autor fue un logopeda; logopedas y médicos con títulos académicos desde la licenciatura hasta el doctorado; número de autores entre tres y siete. Cuatro estudios fueron transversales y abordaron sólo la autoevaluación vocal. Se publicaron tres estudios como artículos originales, uno como una comunicación breve y otro como una revisión. El tamaño de la muestra osciló entre 12 y 60 individuos; cada revista publicó al menos un artículo sobre el tema. **Conclusión:** existe una baja producción científica publicada en las revistas brasileñas de Logopedia sobre los parámetros multidimensionales de la voz asociados a la tiroidectomía, ya que en 15 años sólo se han publicado cinco estudios sobre el tema.

Palabras clave: Disfonía; Voz; Tiroidectomía; Fonoaudiología; Bibliometría. Brasil.

Introduction

The thyroid gland is composed of two lateral lobes and a central isthmus, located in the neck region, anterior to the cricoid cartilage and trachea and slightly inferior to the thyroid cartilage.¹ Through the activity of the hormones it produces, the thyroid is responsible for the growth, development and regulation of the metabolic processes of the body.²

Thyroid activity may be affected by benign and malignant diseases and thyroidectomy, which is the procedure for partial or total removal of the gland, is one of the treatment options.³⁻⁶ However, the close anatomical proximity of the thyroid to the laryngeal nerves exposes the patient submitted to thyroidectomy to the risk of vocal changes after the procedure^{1,3-8}. These changes may result from factors such as surgery extension^{1,8}, the surgical technique used⁹, orotracheal intubation^{4,5} and manipulation of the laryngeal nerves³⁻⁵ with the possibility of paresis or paralysis of vocal folds^{3,6}. In addition, there are patients with pharyngolaryngeal symptoms such as hoarseness, fatigue when speaking, dry throat, throat clearing, itchy throat and difficulties to reach high frequencies^{10,11} even in the absence of peripheral nerve injuries, which is a condition that has been called “post-thyroidectomy syndrome”³ and that may lead patients to seek speech-language pathology treatment.⁷

Given this perspective, there is a demand for investment in scientific productions that address the association between thyroidectomy and its possible consequences on perceptual-auditory, acoustic and self-assessment parameters that are multidimensional components of the voice. The specialized journals in Speech, Language and Hearing Sciences in Brazil have a great reach potential among speech-language pathologists, promoting access to scientific evidence that contribute to their

clinical practice. In this sense, it is necessary to understand how the production of knowledge on multidimensional voice parameters associated with thyroidectomy has been addressed in these journals.

The bibliometric study is one of the strategies in order to investigate how scientific knowledge on a given topic is explored in the literature. This type of literature review enables to analyze the context of published scientific production based on metric indicators that represent the scientific development of the researched area and make it possible to assist productivity and advance knowledge on a given topic.¹²

Therefore, this study aims to analyze the profile of the scientific production published from 2005 to 2019 in the Brazilian journals of Speech, Language and Hearing Sciences on multidimensional voice parameters associated with thyroidectomy.

Methods

This is a literature review study with a bibliometric approach. As a documentary study restricted to the analysis of the scientific literature, it was not necessary to submit the project to the Research Ethics Committee with Human Beings.

Data collection was carried out in January 2020 when Brazilian journals specialized in Speech Therapy indexed from 2005 to 2019 were selected. The following journals were included: *Audiology Communication Research* (ACR), CoDAS, *Distúrbios de Comunicação* and *Revista CEFAC*.

The study included original articles, reviews, case studies, short communications and editorial reviews that were published during the period assessed and that had results on perceptual-auditory, acoustic and/or self-assessment parameters of the voice before or after thyroidectomy. Abstracts of dissertations, theses, letters to the editor and conference proceedings were not included. The

search was performed independently by two researchers in the electronic database of each journal using descriptors in Brazilian Portuguese that are available at DeCS (Health Sciences Descriptors), according to the following crossing strategy: *disfonia* AND (*neoplasias da glândula tireoide* OR *tireoidectomia*).

Article screening was first performed by reading the titles and abstracts and then by a full-text reading. The following information was extracted as analysis variables: the region where the study was conducted, institutions involved in the study, number of institutions involved, numbers of authors who participated in the study, degree and academic background of the authors (with complementary

consultation to the Lattes Platform), journal in which the study was published, type of article, type of study, sample size and type of vocal parameter assessed (perceptual-auditory, acoustic and/or self-assessment). The analysis was done descriptively and included the distribution of absolute and relative frequencies.

Results

Seven articles were found and two of these were excluded for not meeting the inclusion criteria. Therefore, five articles were selected for full-text reading and bibliometric analysis, as shown in the flow chart in Figure 1.

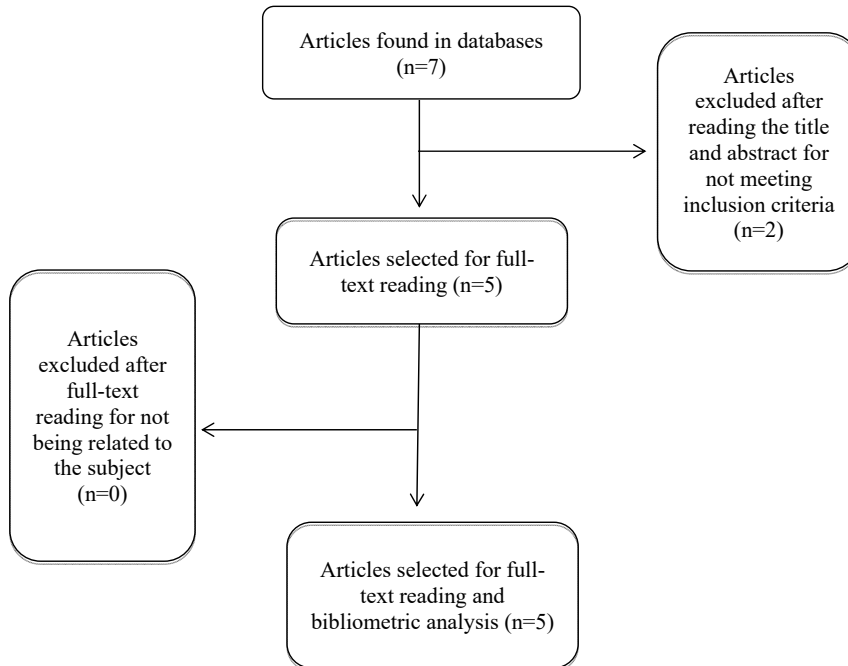


Figure 1. Flow chart of study selection

The variables extracted from the selected articles are shown in Table 1. The first article on the topic from 2005 to 2019 was published in 2015, followed by an article in 2016, two in 2017 and one in 2019. The Southeast and Northeast regions stood out with two studies published, while the other study was conducted in the South region. Four studies were conducted in federal educational institutions and two of them did not involve interinstitutional partnerships, unlike the others. The number of authors ranged from three to seven, involving speech-language pathologists, nurses and doctors. The first author was graduated in Nursing, and not in Speech-Language Pathology, in just one article. The academic degree of the first

author ranged from undergraduate (two articles), Masters (two articles) and Doctorate (one article).

Two articles were published in the Revista CEFAC, one in ACR, one in CoDAS and one in the Distúrbios de Comunicação. Among the five articles included in this review, three were published as original studies, one as a short communication and one as a review of an international article. The sample size ranged from 32 to 60 individuals, but no sample calculation was provided and sampling procedure was for convenience. The four studies focused on the vocal self-assessment of the patient before and/or after thyroidectomy. Three studies addressed the impact of the voice on the patient's quality of life, while two studies performed a survey of vocal and swallowing symptoms.

Chart 1. Variables related to studies that addressed vocal changes and thyroidectomy, published in Brazilian journals specialized in Speech-Language and Hearing Science, from 2005 to 2019.

Authors	Year	Region	Institution	Number of institution	Number of authors	Specialization of the 1st author	Academic degree of the 1st author	Specialization of co-authors	Journal	Type of article and study	Sample size and sampling	Type of vocal parameter assessed
Nascimento Junior, Carra-de Angelis, Lima (2015) ¹³	2015	Southeast	Instituto de Gerenciamento em Deglutição - IGD São Paulo, SP, Brazil	3	3	Speech-language pathologist	Master's Degree	Speech-language pathology Bachelor of medicine	CEFAC	Original article, cross-sectional study	n=32 Sample for convenience	Self-assessment - Quality of life in voice
Koga, Leite, Ribeiro (2016) ¹⁴	2016	South	Hospital das Clínicas at the Universidade Federal do Paraná - HC-UFPR - Curitiba (PR), Brazil.	3	3	Nurse	Master's Degree	Speech-language pathology	CEFAC	Short communication, cross-sectional study	n=60 Sample for convenience	Self-assessment - Quality of life in voice
Guimarães et al. (2017) ¹⁵	2017	Southeast	Universidade Federal do Espírito Santo, Vitória, ES, Brazil.	1	6	Speech-language pathologist	Doctoral Degree	Speech-language pathology	Distúrbios da Comunicação	Review	Not applicable	Not applicable
Araújo, Lopes, Silva, Perrusi, Farias, Azevedo (2017) ¹⁶	2017	Northeast	Universidade Federal da Paraíba - UFPB - João Pessoa (PB), Brazil.	4	6	Speech-language pathologist	Undergraduate Degree	Speech-language pathology Bachelor of medicine	CoDAS	Original article, cross-sectional study	n=12 Sample for convenience	Self-assessment - Swallowing and voice symptoms
Cruz et al. (2019) ¹¹	2019	Northeast	Universidade Federal da Paraíba - UFPB - João Pessoa (PB), Brazil	1	7	Speech-language pathologist	Undergraduate Degree	Speech-language pathology	ACR	Original article, cross-sectional study	n=51 Sample for convenience	Self-assessment - Swallowing and voice symptoms

Discussion

This bibliometric review found that there were few publications from 2005 to 2019 that addressed the association between vocal aspects and thyroidectomy in Brazilian journals specialized in Speech, Language and Hearing Sciences. The first study on the topic in these journals within the period examined was published in 2015; that is, there was a gap of at least 10 years without a single study on the association of voice changes and thyroidectomy in the Speech, Language and Hearing Sciences journals. Furthermore, the published articles restricted their

outcome to aspects of functional self-assessment or quality of life.

The results of this study suggest that the topic has received the attention of journals in the field of Speech, Language and Hearing Sciences only recently, which is probably due to the greater interest of researchers in the field of Voice. The investment in these studies may also be related to the growing number of thyroidectomies in recent years, which leads to more patients with vocal complaints and requires further scientific investigations that may provide more support to the speech-language pathology clinic.

It should also be considered that, within the period covered in this review, some Brazilian researchers who have explored the topic may have published the results of their studies in journals in related fields or international journals with higher impact, probably in order to expand the recognition or visibility of their research and even according to requirement criteria of the bodies that regulate the development of science in Brazil.¹⁶ However, the greater receptivity of national journals specializing in Speech, Language and Hearing Sciences to research on the topic and the increasing progress in the quality of these journals is expected to change this scenario in the future and encourage publication in national journals.

The results of this review indicate that there is much to be done in the investigation of vocal aspects associated with thyroidectomy in journals in the field of Speech, Language and Hearing Sciences. This advancement process includes perspectives such as improving the study designs beyond the cross-sectional design and diversifying the main research outcome without regard to the investigated vocal parameters. In addition, further studies with a higher level of evidence are needed, with samples that are more representative and come from a more robust sampling process.

Therefore, and given the notorious challenges of the research field in Brazil, especially in relation to subsidies that could encourage the implementation of projects, it is suggested that researchers in the field are increasingly aware of methodological issues and that they can practice interinstitutional partnerships in order to facilitate the execution of new research. Most quality research projects have a high cost, in addition to requiring time and dedication from researchers who, in addition, are unable to focus exclusively on projects due to scholarships that are not compatible with the demand required.¹⁷ This explains, in part, the cheaper study design in all the articles found, as they are cross-sectional studies and mostly use questionnaires as data collection tools.

On the other hand, the diversity of institutions involved, as well as the number of co-authors and different academic backgrounds found in the articles included in this review point to a path towards the strengthening of collaboration networks. As Brazilian research has traditionally been concentrated in universities, especially in federal institutions of higher education, the growth of this

movement from groups linked to these institutions is natural. This could be seen in the greater number of articles from research groups of federal universities, distributed in the South, Northeast and Southeast regions. A greater expressiveness was expected from the Southeast region, as there are historical issues of centralized development of higher education institutions in this region, which still concentrates a relevant hub of universities and colleges.¹⁸ However, the Northeast region had the same number of publications, which may be an indication of a paradigm shift in this sense, probably related to the increase in the number of undergraduate and graduate courses in Speech-Language Pathology in this region in the last two decades.

Most authors were speech-language pathologists as expected, since the field of voice is one of the specialties recognized by the class council. However, the presence of Medicine and Nursing shows a multidisciplinary interest, which increases the possibilities of advances in this context. In addition, the construction of a collective and collaborative knowledge production model, in which the partnership between academia and society (companies, public entities, third sector organizations, etc.) plays a more active and direct role in the production of knowledge seems to be an alternative to overcome some adversities in the scope of research^{19,20}.

The results of this bibliometric review indicate that the low number of productions found limits the scientific bases that future researchers and professionals interested in the topic must have in order to increase the quality of research and the efficiency in the services provided. Further bibliometric review studies are encouraged to expand the scope of this study and analyze the production pattern on the subject in national and international journals in general.

Conclusion

This bibliometric review showed that the association between vocal aspects and thyroidectomy was rarely addressed in Brazilian journals in the field of Speech, Language and Hearing Sciences between 2005 and 2019. The profile of the studies included publications made with interinstitutional partnerships, predominantly in federal universities located in the Southeast and Northeast regions. In most cases, the first author had a degree in Speech-

Language and Hearing Science with an academic degree that ranged from undergraduate to doctorate. In turn, the co-authors included speech-language pathologists and doctors, ranging from three to seven in number. Except for one review, all other studies were cross-sectional studies with samples ranging from 12 to 60 participants and having vocal self-assessment as the main outcome.

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