

## Original articles

# Speech-Language Pathologists with a PhD in Brazil: profile of professional training and scientific production in the voice area

**Lésle Piccolotto Ferreira<sup>1</sup>**

<https://orcid.org/0000-0002-3230-7248>

**Alice Prado de Azevedo Antunes<sup>1</sup>**

<https://orcid.org/0000-0003-1650-517X>

**Andressa Medeiros Marinoni-Prado<sup>1</sup>**

<https://orcid.org/0000-0003-4994-243X>

**Daniella Spacassassi Centurió<sup>1</sup>**

<https://orcid.org/0000-0002-1184-6357>

**Lillian Gattelli Lima<sup>1</sup>**

<https://orcid.org/0000-0001-7126-1572>

**Matheus Rodrigues da Silva<sup>1</sup>**

<https://orcid.org/0000-0001-7922-424X>

**Michael Álex dos Santos<sup>1</sup>**

<https://orcid.org/0000-0001-7157-3365>

**Pablo Rodrigo Rocha Ferraz<sup>2</sup>**

<https://orcid.org/0000-0003-4612-2612>

<sup>1</sup> Pontifícia Universidade Católica de São Paulo – PUC-SP, São Paulo, São Paulo, Brasil.

<sup>2</sup> Secretaria de Estado da Saúde do Maranhão - SES/MA, São Luís, Maranhão, Brasil.

Study conducted at the Pontifícia Universidade Católica de São Paulo – PUC-SP, São Paulo, São Paulo, Brazil.

Research support source: CAPES - Coordenação de Aperfeiçoamento de Pessoal de Nível Superior and CNPq - Conselho Nacional de Desenvolvimento Científico e Tecnológico (Process no. 305995/2016-2).

Conflict of interests: Nonexistent



Received on: May 27, 2019  
Approved on: October 24, 2019

### Corresponding address:

Pablo Ferraz  
Rua 85, n° 29, Edifício Triton, Apto 204,  
Vinhais  
CEP: 65074-310 - São Luís do Maranhão,  
Maranhão, Brasil  
E-mail: pablorrff@uol.com.br

## ABSTRACT

**Purpose:** to investigate, among the Brazilian Speech-Language Pathologists with a doctoral degree, who analyzed voice-related aspects in their theses, the variables gender, year of defense of the thesis, type and location of the educational institution, inclusion of the program through which the thesis was developed, thesis' theme and the authors' scientific production in the last 10 years.

**Methods:** data collected through a survey on the Lattes Platform from 1986 to 2017. Inclusion criteria were having a degree in Speech-Language Pathology, being Brazilian and having a doctoral degree. The variables defined were recorded in the STATA/IC 14.2, a descriptive analysis of the data was performed, and the growth trend of the number of theses was determined.

**Results:** most of the 104 professionals who composed the sample were females, with a doctoral degree from a federal public institution located in the Southeast region, and who defended a thesis related to Clinical Voice in specific programs in the area (Human Communication Disorders; Speech-Language Pathology; Speech-Language Pathology, Physical therapy and Occupational Therapy). Article production included 1,458 articles published in the analyzed period, with 6,867 citations in various databases.

**Conclusion:** there has been a steady growth in the number of theses defended in the voice area in the last 30 years, but still concentrated on clinical voice sub-areas, in federal public institutions, predominantly in the Brazilian Southeast region, and in specific programs for Speech-Language Pathology.

**Keywords:** Speech, Language and Hearing Sciences; Teaching; Scientific Production Indicators; Graduate Degree Teaching

## INTRODUCTION

When derived from scientific knowledge, innovation is the result of a continuous cycle that uses research as a lever for development<sup>1</sup>.

In turn, the research is directly related to the actions of graduate courses of universities in generating this knowledge<sup>2</sup>, since this educational level is of primary importance in the qualification of specialists, and professionals with a master's degree and a doctoral degree, thus consolidating the progression of technology and the profession<sup>3</sup>.

The Brazilian strict sense graduate course had a relatively late start in the Ministry of Education with the establishment of the CAPES in 1951, which aimed to implement the national graduate policy. Despite being the foundation to leverage and consolidate research, there is a scarce literature on the evolution of strict sense graduate studies<sup>4</sup>, which makes it difficult to analyze the performance of a particular profession, its relationship with research and professional practices, either technical or academic.

Thus, besides improving graduate qualification, the analysis of bibliographic production stimulates scientific research, promotes teaching and also contributes to the evolution of knowledge in the field<sup>2</sup>.

Particularly in speech-language pathology, some studies aiming to analyze the qualification of professionals with a doctoral degree report that the first defense of thesis occurred in 1976<sup>4</sup>, although the profession was legally recognized only in the 1980s. In this survey, which considered the theses defended by speech therapists as the object of study, it should be noted that among the 91 theses in the analyzed period (1976-1998) in the first survey, 8 (8.8%) addressed the analysis of voice issues and its disorders<sup>5</sup>.

In a study published in 2004, the same authors recorded 203 theses in the period between 1976 and 2003, and among these, 30 (14.8%) addressed the issues related to voice<sup>6</sup>.

Six years later, in order to keep this survey updated, the authors have published a new article selecting 504 theses in total (defended from 1976-2008), and 58 (11.51%) of which discussed voice issues. It is worth noting that when the variability explained by the quadratic model in this study was applied to the thesis survey, a 61% growth was reported for voice<sup>4</sup>. Finally, in order to complement the previous survey, when analyzing only the period from 2009-2013, among the 271 theses surveyed, 36 (13.3%) were related to the voice subfield, which allows us to estimate that a total

of 94 theses were defended by the end of the period analyzed<sup>7</sup>.

Not only in these surveys, but also in another one in which the objective was to analyze the dissertations and theses defended in a Speech-Language Pathology graduate program<sup>8</sup>, considering a time period of 40 years (1972-2012), Voice is always reported in third place, following Language and Hearing and Balance.

This survey allows to observe a movement of speech-language pathologists towards a higher scientific qualification, which is also perceived in other areas of science, especially those related to health<sup>9-11</sup>.

Despite the studies listed, there are still few analyzes, for example, on how much, where and when the strict sense graduate education has been growing over time, at the national, regional and administrative levels (public or private) of the IES<sup>12</sup>.

In addition, a survey of professionals with a doctoral degree in an area may generate significant indicators to analyze its maturity and consequently, predict the scientific production potential to be recognized by the funding agencies and reflect on the improvement of the practice in all the possible fields<sup>4</sup>.

Therefore, the purpose of this research was to investigate, among the Brazilian Speech-Language Pathologists with a doctoral degree, who analyzed voice-related aspects in their theses, the variables gender, year of defense of the thesis, type and location of the educational institution, inclusion of the program through which the thesis was developed, thesis' theme and the authors' scientific production in the last 10 years.

## METHODS

According to the study design, there was no need for approval by the research ethics committee. The data were collected on April 3, 2018, through a consultation in the Lattes Platform of the National Council for Scientific and Technological Development (CNPq). On the home page, the section "Search Lattes Curriculum (Simple Search)" was accessed, and then the following options were checked in "Search mode": "Name", "On database", "With doctoral degree" and "Brazilians and foreigners". The subsection "Area of activity" was checked in the "Filter type" session, in which the search was restricted according to the curriculum, using "Health Sciences" and "Speech-Language Pathology" as descriptors for "Broader area" and "Area", respectively. It was found in the results that other professionals, who performed activities related to

Speech-Language Pathology and Audiology, were part of this list. Thus, each curriculum was accessed and the inclusion criteria was having a degree in Speech-Language Pathology, being Brazilian and also having a doctoral degree.

After the survey, the period of analysis consisted of the period from 1976 (first record) to 2017. 1,333 records were identified. Of these, 208 were excluded since they did not fit the criteria for analysis: 25 without a doctoral degree, 147 without a degree in Speech-Language Pathology, 18 foreigners, 1 duplicate, 1 with no profile identified and 16 defenses in 2018. Remaining 1,125 theses were eligible for analysis.

After this stage and with all the tabulated data, a new search and sample selection was conducted, including thesis defended in the Voice area as eligibility criteria. As a result of the survey, the analysis period ranges from 1986 (record of the first thesis defended in the voice area) to 2017. 105 cases of doctoral degree were identified, but 01 was excluded due to the lack of identification, so the final sample consisted of 104 theses eligible for analysis.

The study variables were: the thesis topic; type of educational institution (Public State, Federal, Private or International); geographic region of the institution (North, Northeast, Southeast, South, Central-West); country of the institution; area of knowledge of the CNPq (Health Sciences, Human Sciences, Biological Sciences, Social Sciences, Exact Sciences or Linguistics, Languages and Arts); subfield of expertise for Speech-Language Pathology practice in Voice established and recognized by the Brazilian Society of Speech-Language Pathology and Audiology - SBFa (Head and neck, Professional voice and Clinical voice), year of defense of the thesis, period of defense of the thesis (grouping of the years of defense as: 1976-1992, 1993-1997, 1998-2002, 2003-2007, 2008-2012, and 2013-2017); time (years) between undergraduate and doctoral degrees (grouping of the years as: 6.0-7.9; 8.0-10.9; 11-15.9; 16.0-20.9; 21.0-25.9 and  $\geq 26.0$ ). As for the authors of the thesis, the variables corresponding to gender and total number of articles published in the last 10 years were considered, with the name of the journal being registered, and citation of the author's articles in the Web of Science, Scopus and Scielo databases. Finally, a survey was made as to whether the author was awarded the distinguished degree or merit granted by the SBFa.

At first, a descriptive analysis of the data was performed using absolute and relative frequencies. The tendency to increase the number of theses defended per year was evaluated through linear regression models, quadratic (polynomial of degree 2) and exponential models, with the quadratic model showing the best predictive ability in all the tests. The quadratic regression model uses the following equation:  $y = a + bx + cx^2$ , where the dependent variable (Y) is the number of theses and the independent variable (x) is the year of defense. The initial year of the analysis was standardized by subtracting the first year assessed, so that year 0 (zero) represents the number of theses in the first year of the analysis (1986). Regarding the published articles, the number of articles published according to the subfield of expertise in the doctoral period (2008-2017) was compared using the non-parametric Kruskal-Wallis test for variables with 3 or more categories, and the homogeneity of variance was assessed by Bartlett's test. A statistically significant difference of  $p < 0.050$  was considered in all analyzes. The analyzes were performed using the STATA/IC 14.2 software and the graphs and figures were created through the Microsoft Excel 2016.

## RESULTS

The analysis period consisted of 32 years (1986 to 2017) with 104 theses defended. Table 1 shows that 95.2% of the authors of the theses were females, and that 50.0% defended their theses in a period between 8.0 and 15.9 years after graduation.

As for the educational institution, most professionals with a doctoral degree chose federal public institutions (45.2%), located in Brazil (97.1%), and predominantly in the Southeast region (78.8%). Health Sciences (73.1%) was the most frequent area of knowledge.

The most frequent graduate program for obtaining doctoral degrees was the group that comprised the specifics of the area, that is, Human Communication Disorders; Speech-Language Pathology; Speech-Language Pathology, Physical Therapy and Occupational Therapy (28.9%), followed by Applied linguistics and Language Studies/Language and Literature/Linguistics (14.4%). It is worth highlighting the great variability in the analysis of the other non-specific programs in the area, and that the category "Other" included 15 (14.4%) different programs that had only 01 doctoral defense registered in each of them.

As for the subfield of expertise in Voice, considering the SBFa Department Committees, clinical voice (57.7%) and professional voice (32.7%) were the most frequently developed topics. The number of theses

completed over the years was higher in the last periods analyzed, with the greatest proportions recorded from 2013-2017 (35.6%) and from 2008-2012 (26.9%).

**Table 1.** Distribution of theses defended by Brazilian speech-language pathologists in the voice field, according to characteristics of the authors, educational institutions, geographic region, knowledge area, subfield of expertise and completion period, 1986-2017

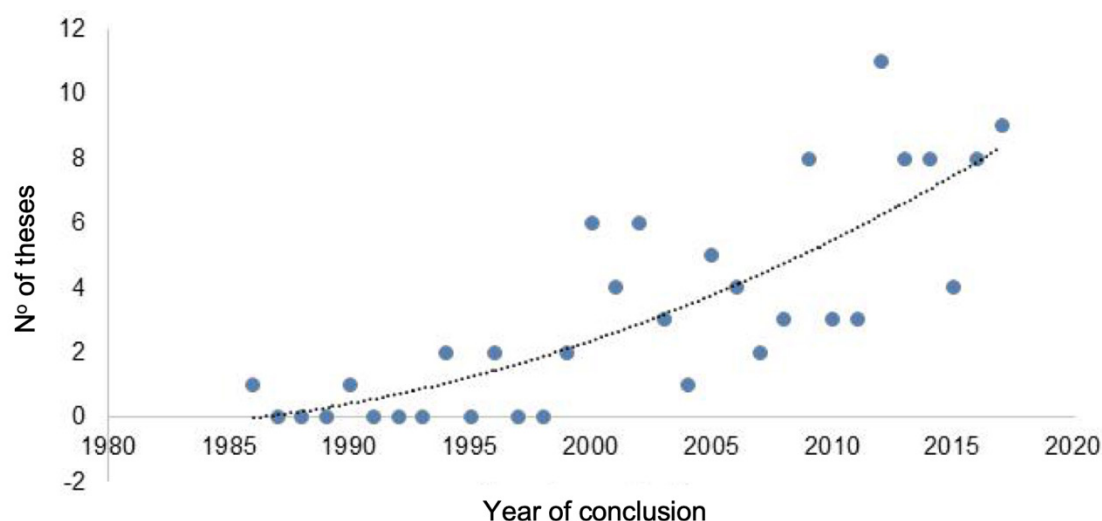
Variables	Total	
	No.	Percentage (%)
<b>Gender</b>		
Females	99	95.2
Males	5	4.8
<b>Time between undergraduate and doctoral degrees (years)</b>		
6.0-7.9	10	9.6
8.0-10.9	24	23.1
11.0-15.9	28	26.9
16.0-20.9	18	17.3
21.0-25.9	8	7.7
≥26.0	15	14.4
Not reported	1	1.0
<b>Type of educational institution</b>		
Public State	31	29.8
Public Federal	47	45.2
Private	23	22.1
International	3	2.9
<b>Geographic regions</b>		
North	1	1.0
Northeast	8	7.7
Southeast	82	78.8
South	9	8.7
Midwest	1	1.0
Other countries – Argentina	3	2.9
<b>Knowledge area</b>		
Health Sciences	76	73.1
Human Sciences	8	7.7
Biological Sciences	2	1.9
Social Sciences	0	0.0
Exact Sciences	2	1.9
Linguistics, Literature and Arts	16	15.4
<b>Program</b>		
Human communication disorders	24	23.1
Applied linguistics and language studies	10	9.6
Health sciences	5	4.8
Collective health/Public health	5	4.8
General surgery bases	4	3.8
Education	4	3.8
Bioengineering	3	2.9
Medical sciences	3	2.9
Speech-language pathology	3	2.9

Variables	Total	
	No.	Percentage (%)
Speech-language pathology, physical therapy and occupational therapy	3	2.9
Language and literature	3	2.9
Communication disorders	3	2.9
Performing arts	2	1.9
Science	2	1.9
Biological sciences	2	1.9
Rehabilitation sciences	2	1.9
Linguistics	2	1.9
Medicine	2	1.9
Psychobiology	2	1.9
Psychology	2	1.9
Social psychology	2	1.9
Other	15	14.4
<b>Subfield of expertise</b>		
Head and neck	5	4.8
Professional voice	34	32.7
Clinical voice	60	57.7
Other voice-related topics	5	4.8
<b>Period of completion (year) of the doctoral degree</b>		
1986-1997	6	5.8
1998-2002	18	17.3
2003-2007	15	14.4
2008-2012	28	26.9
2013-2017	37	35.6
<b>Total</b>	<b>104</b>	<b>100.0</b>

Figure 1 and Table 2 show that there was an increase in the number of theses during the analysis period (1986 to 2017). The quadratic model predicted a 64.4% growth variability when considering the total sample regardless of the subfield. The growth starts from the 2000s, with slight intensification from 2009, but with great annual variability. This growth was statistically significant ( $p < 0.001$ ).

Similarly, Table 2 illustrates the growth of different subfields of expertise of voice in Speech-Language Pathology. Statistically, there was a significant growth

in clinical voice ( $p < 0.001$ ) and professional voice ( $p = 0.001$ ) subfields, which had a higher number of thesis and presented the best adjustments (growth variability of 64.9% and 37.0%, respectively). The head and neck subfield and the category called “Other voice-related topics” (which included studies in the field of histology, clinical psychology, among others) had a small number of cases without a growth pattern and without a statistical significance ( $p = 0.224$ , and  $p = 0.527$ , respectively).



**Figure 1.** Increase (adjusted by quadratic regression model) in the number of theses with voice as field of expertise defended by Brazilian speech-language pathologists, 1986-2017

**Table 2.** Quadratic regression models for the number of theses defended by Brazilian speech-language pathologists with voice as field of expertise, 1986-2017

Subfield of expertise	No. of Theses	Equation	r <sup>2</sup>	p-value
General voice (all subfields)	104	$y = -0.0391 + 0.0897x + 0.0058x^2$	0.6436	<0.001
Head and neck	5	$y = -0.0396 + 0.0080x + 0.0002x^2$	0.0981	0.224
Professional voice	34	$y = -0.4732 + 0.1186x - 0.0009x^2$	0.3702	0.001
Clinical voice	60	$y = 0.5578 - 0.0699x + 0.0074x^2$	0.6487	<0.001
Other voice-related topics	5	$y = -0.0840 + 0.0330x - 0.0008x^2$	0.0432	0.527

There were 1,458 articles published in the last 10 years (2008-2017) and, among them, 1,093 (75.0%) were related to specific Voice subfields (head and neck, professional voice and clinical voice), while the remaining publications were related to other specialty areas of Speech-Language Pathology. With respect to specific publications, following the findings previously reported regarding the defense in greater numbers in the areas of clinical voice and professional voice, the most frequent were also in these subfields (43.0% and 29.4%, respectively). The 1,093 publications specific related to the Voice area corresponded to an average of 10.5 articles per speech-language pathologist

(median=5.0; standard deviation=18.2), while 15 people did not register any publication and 2 people published more than 90 articles each.

Table 3 shows the distribution of the 1,093 articles published in the specific areas of voice among the speech-language pathologists analyzed in this study and according to their subfield of expertise and time periods. The clinical voice subfield had the highest number of articles, with an average of 12.9 publications per author; however, this difference was not statistically significant when compared to other subfields ( $p=0.503$ ).



**Table 3.** Descriptive statistics of studies, according to Voice subfields\* published in the last 10 years, Brazilian speech-language pathologists with a doctoral degree, 2008-2017

Variable	No.	Mean	Standard deviation	p-value
<b>Studies according to Voice subfields</b>				
Head and neck	31	6.2	8.3	0.503 (K)
Professional voice	269	7.9	8.4	
Clinical voice	774	12.9	22.7	
Other	19	3.8	3.8	
Total	1,093	10.5	18.2	

(K) = Kruskal-Wallis Test

\* Voice subfields: Head and neck, Professional and Clinical

When considering the total number of articles published (1,458), Table 4 shows that the journals with the greater number of publications (making it clear that there was a concern to retrieve the history of each journal, when another name was provided, or

a given journal was incorporated into the other) were: Revista da Sociedade Brasileira de Fonoaudiologia/ACR (18.8%), Revista CEFAC (16.8%), Pró-Fono/Jornal Brasileiro da SBFa/CoDAS (14.9%), Journal of Voice (13.6%) and DIC (2.9%).

**Table 4.** Distribution of studies published in the last 10 years by scientific journals, Brazilian speech-language pathologists with a doctoral degree, 1986-2017

Journal	No.	Percentage (%)
CEFAC	245	16.8
Journal of Voice	199	13.6
CoDAS (2013)	169	11.6
Revista da Sociedade Brasileira de Fonoaudiologia	109	11.3
ACR (2013)	42	7.5
DIC	42	2.9
International Archives of Otorhinolaryngology	32	2.2
Pró-Fono	29	2.0
Folia Phoniatria et Logopaedica	27	1.9
Brazilian Journal of Otorhinolaryngology (2009)	23	1.6
Jornal da Sociedade Brasileira de Fonoaudiologia	19	1.3
Revista Brasileira de Otorrinolaringologia	12	0.8
Intercâmbio	12	0.8
Otolaryngology and Head and Neck Surgery	12	0.8
Revue de Laryngologie, d'Otologie et Rhinologie	12	0.8
Revista Brasileira de Cirurgia da Cabeça e Pescoço	10	0.7
Revista Brasileira de Qualidade de Vida	8	0.5
Tecer	6	0.4
Revista Kairós	6	0.4
Ciência & Saúde Coletiva	6	0.4
Other (less than 6 articles published)	304	20.9
Unknown	11	0.8
Total	1,458	100.0

The 1,458 articles received 6,867 citations in the databases, corresponding to an average of 4.7 citations per article: Scielo – 2,982 citations (average of 2.0 per article) Scopus – 2,803 citations (average of 1.9 per article) and Web of Science – 1,082 citations (average of 0.7 per article). Additionally, since the Brazilian Society of Speech-Language Pathology and Audiology created its awards, some professionals with doctoral degrees have also received these awards in the voice area, of which 16 achievement awards (2002-2017) and 2 merit awards (2003-2017).

## DISCUSSION

Understanding the evolution of the scientific production of a given profession allows to understand the paths and the initiatives of the professions and graduate programs to foster research and consolidate science over the years.

It should be noted that the Brazilian experience of knowledge generation in strict sensu graduate studies in the last ten years is one of the relatively successful achievements throughout the existing education system, providing qualification to courses and professionals in various areas of knowledge and regions of the country. However, there are still few analyzes and studies on how, where and when strict sensu graduate education has grown over time, both nationally and regionally, by IES administrative category (public or private), hindering a panoramic and systematic analysis on the subject<sup>12</sup>, therefore, this research is inserted in this context.

There is a predominance of female authors among the theses, as already identified in previous studies<sup>4-8</sup>, which can be explained by the interest of women in courses related to Biological and Human Sciences<sup>13</sup> and it is a feature also present in the Speech-Language Pathology since its origins. An interesting perspective regarding the choice of courses with a male or female “profile” concerns the identity that is built on social practices and on people’s perceptions and evaluations of themselves and others<sup>14,15</sup>, such as caring for others, being pragmatic, reflective, among others.

Half of the speech-language pathologists with a doctoral degree defended their thesis from 8.0 to 15.9 years after graduation. Comparatively, in a study with professionals with a doctorate degree in Education<sup>16</sup>, a third of them obtained the degree between 10 and 15 years after graduation. Although these periods vary, they are in line with the most scientifically advanced countries, where the average is 14 years<sup>17</sup>, with a

possible association with the period that professionals had to have a positive perception of their work and to be professionally stabilized.

The record of the largest number of professionals with doctoral degrees in this research being from the Southeast region (78.8%) is indicated by the report of the Coordination of Improvement of Higher Education Personnel - CAPES<sup>11</sup>, which reports an increase of professionals with degrees in the last years with greater concentration in this region<sup>18,19</sup>. It is noteworthy that this is also influenced by the significant growth of 423.8% of programs in the Southeast and South in private education over a period of 13 years, which consequently increases the number of professionals with such degrees<sup>12</sup>.

Data from this research show that the largest percentage of studies is linked to federal public institutions<sup>20</sup>, which may be related to the fact that Federal University of São Paulo (UNIFESP) was the first doctoral program in Speech-Language Pathology, and subsequently contributed to the qualification of other programs, besides having graduated the first professional with a doctoral degree in the field of voice, which enabled the qualification of others.

With the growth of programs and the encourage to access to graduate strict sensu over the years, there is an increasingly frequent choice for specific programs related to the subject’s degree area<sup>20</sup>, which corroborates the findings of this research, in which the Human Communication Disorders; Speech-Language Pathology; Speech-Language Pathology, Physical Therapy and Occupational Therapy - (28.9%) and Applied Linguistics and Language Studies/Language and Literature/Linguistics (14.4%) programs were the most popular.

The greater access to the various graduate areas, especially in the area 21 of CAPES (which includes Physical Education, Physical Therapy, Speech-Language Pathology and Occupational Therapy)<sup>12,21</sup> and the increase in the number of theses defended during the analysis period (1986-2017), allowed to identify a 64.4% prediction of growth variability in the Voice area. Considering the subfields, according to the SBFa Department Committees, it was possible to notice a growth variability for clinical voice (64.9%) and professional voice (37.0%). The greater volume may be related to the clinical voice subfield may be due to the fact that the first activities of speech-language pathology were focused on individual voice complaints and rehabilitation. Studies of vocal health care began



to be conducted in the mid-1970s, specifically with teachers, and it was not until the 1990s that speech-language pathologists expanded their studies to professional voice, which explains the second higher frequency of theses in this field<sup>22</sup>.

Given the 1,458 studies published in the last 10 years (2008-2017), it has to be considered that most of the speech-language pathologists analyzed in this article, who do not follow an academic career, have no interest in performing researches or in registering the research in the Lattes Platform, when published<sup>23</sup>, which may explain the high standard deviation found when analyzing articles by each professional.

With respect to the 1,093 (75.0%) studies directly related to Voice, it would be expected that they addressed themes related to clinical voice and professional voice in a larger number and average of articles by author, since these are the subfields in which speech-language pathologists have earned a doctorate degree. The discrepancy between professionals with a doctoral degree regarding the average number of studies published is also highlighted in researches<sup>17,24</sup> that analyzed the production of professors of interdisciplinary graduate programs in Brazil.

Most of the articles published between 2008 and 2017 is concentrated in seven national journals (and part of them are incorporated to each other) and one international journal related to Speech-Language Pathology (58.6% -Revista CEFAC, Pró-Fono/Jornal Brasileiro da SBFa/CoDAS, Revista da Sociedade Brasileira de Fonoaudiologia/ACR, DIC and Journal of Voice). It should be noted that the first six journals are categorized by CAPES (Qualis 2013-2016 Edition) as B1, while DIC is classified as B2 and the Journal of Voice is classified as A2, that is, there was no A1 journal registered among the studies analyzed.

It is interesting to understand the bibliometric indicators, since they allow to evaluate the growth of the scientific field, with reference to the variation of the number of published works, the chronological evaluation of the bibliographic production according to the year of publication, and the productivity of the authors measured by the number of published works<sup>25</sup>, in addition to the visibility of the journals in which the results of their researches are published<sup>2,26</sup>.

Although not very common, there is a growing trend to evaluate researchers by bibliometric indicators<sup>27</sup>. As for the citations in the databases, the findings of this research show a higher frequency of citation in journals hosted at Scielo, which is an open access platform of a

research project of the São Paulo Research Foundation (FAPESP), in a partnership with the Latin American and Caribbean Center on Health Sciences Information - BIREME. Given Capes' requirements on the need for programs and researchers to internationalize, there will certainly be a production movement on other platforms in the coming years. Some paths need to be followed and crossed for this to happen: the quality of written English, the *lingua franca* of academic research; the reflection on the large number of journals, which decreases the stringency, requirement and quality levels of articles; and the difficulty in financial incentives, either by adequate structure/equipment, or by granting scholarships to researchers, as well as the full time dedication necessary for the development of the research<sup>28</sup>. While Scopus is currently considered the largest database of web research citations and abstracts, Scielo has achieved remarkable and growing international visibility and credibility as a cooperative base of scientific journals on the internet that was developed for scientific communication in developing countries, particularly in Latin America and the Caribbean<sup>29</sup>.

During the analysis of this study, it was truly possible to notice how the Voice field has solidified its history over the years in professional practice, in the production of clinical and academic knowledge, in addition to the recognition of professional references that provide the required support for the improved continuity of the area.

In this sense, it is important to report that some of these professionals were recognized by the SBFa, and eternalized the meaning of the mention in some of their statements<sup>30</sup> Such as: "...represents the endorsement of our commitment to the speech-language pathology community." (Brasília Maria Chiari); "...a responsibility commitment to my colleagues, patients, clients and advisors." (Mara Behlau); "...it encourages self-overcoming and sets new commitments and challenges." (Léslie Piccolotto Ferreira).

## CONCLUSION

This study reports a steady growth in the number of theses defended in the voice area over the last 30 years, with a focus on clinical voice subfields, in lieu of the professional voice and head and neck subfields.

Most of the 104 Brazilian speech-language pathologists with a doctoral degree who defended Voice-related theses are females and chose to study at federal public institutions located in Brazil, predominantly in the Southeast region, in the area of Health Sciences and

in specific programs for speech-language pathology. During the period analyzed, participants produced 1,458 articles and received 6,867 citations in different databases.

## REFERENCES

1. Audy J. A inovação, o desenvolvimento e o papel da Universidade. *Estud Avançados*. 2017;31(90):75-87.
2. Braga MER, Chiari BM, Goulart BNG. Bibliographic production in articles, books and book chapters in a graduate program in speech-language and hearing sciences: bibliometric analysis. *Distúrb. Comun*. 2014;26(1):118-30.
3. Erdmann AL. Formação de especialistas, mestres e doutores em enfermagem: avanços e perspectivas. *Acta Paul Enferm*. 2009;22(spe1):551-3.
4. Ferreira LP, Russo ICP, Adami F. Fonoaudiólogos doutores no Brasil: perfil da formação no período de 1976 a 2008. *Pró-Fono R. Atual. Cient*. 2010;22(2):89-94.
5. Ferreira LP, Russo I. O perfil das teses de doutorado defendidas por fonoaudiólogos brasileiros. *Pró-Fono R. Atual. Cient*. 1998;10(2):64-70.
6. Russo ICP, Ferreira LP. Fonoaudiólogos doutores no Brasil: análise das teses segundo áreas de atuação e programas. *Pró-Fono R. Atual. Cient*. 2004;16(1):119-30.
7. Paz-Oliveira A, Carmo MP do, Ferreira LP. Brazilian doctors in speech-language pathology and audiology certificated in the period 2009-2013: profile of training. *Rev. CEFAC*. 2015;17(2):586-94.
8. Ferreira LP, Ribas LT, Magrini AM, Diógenes BS, Ditscheiner ES, Cunha MC. Program of graduate studies in Speech Language Pathology and Audiology of Pontifícia Universidade Católica de São Paulo, Brazil: analysis of four decades of production. *Distúrb.Comun*. 2015;27(4):840-8.
9. Haddad AE, Pierantoni CR, Ristoff D, Xavier IM, Giolo J, Silva LB. A trajetória dos cursos de graduação na saúde 1991-2004. Brasília: Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira; 2006.
10. Calvalcante CCL, Rodrigues ARS, Dadalto TV, Silva EB. Evolução científica da fisioterapia em 40 anos de profissão. *Fisioter Mov*. 2011;24(3):513-22.
11. CAPES. Cresce 20,8% o número de cursos de mestrados e doutorados no Brasil [Internet]. 2014 [cited 2019 Feb 23]. Available from: <http://www.capes.gov.br/36-noticias/4073-cresce-208-o-numero-de-cursos-de-mestrados-e-doutorados-no-brasil>
12. Cirani CBS, Campanario MA, Silva HHM. A evolução do ensino da pós-graduação senso estrito no Brasil: análise exploratória e proposições para pesquisa. *Avaliação Rev da Avaliação da Educ Super*. 2015;20(1):163-87.
13. Guilherme P, Moreno AC. Mulheres são maioria na disputa em biológicas e humanas na Fuvest 2013 [Internet]. 2012 [cited 2019 Feb 23]. Available from: <http://g1.globo.com/educacao/noticia/2012/11/mulheres-sao-maioria-na-disputa-em-biologicas-e-humanas-na-fuvest-2013.html>
14. Barreto A. A mulher no ensino superior: distribuição e representatividade. *Cad do GEA*. 2014;3(6):5-45.
15. Artes A, Ricoldi AM. Mulheres e as carreiras de prestígio no ensino superior brasileiro: o não lugar feminino. In: Itaborai NR, Ricoldi AM (eds). *Até onde caminhou a revolução de gênero no Brasil?: implicações demográficas e questões sociais*. Belo Horizonte: ABEP; 2016. p. 81-94.
16. Fávero AA, Tauchen G, Devecchi CVP. Percursos formativos e inserção profissional dos doutores em educação: trajetórias e destino dos egressos. *Educ Teor e Prática*. 2016;26(53):574-94.
17. Soares SV, Casa Nova SPC. Pesquisadores brasileiros que publicam em periódicos internacionais: qual sua formação acadêmica? *Rev Gestão Univ na América Lat - GUAL*. 2017;10(1):125-49.
18. Teixeira RKC, Gonçalves TB, Botelho NM. Análise quantitativa de pós-graduandos em ciências de saúde no Brasil: perfil por estados. *UNOPAR Cient Ciênc Biol Saúde*. 2012;14(3):183-8.
19. Silva TC, Bardagi MP. O aluno de pós-graduação stricto sensu no Brasil: revisão da literatura dos últimos 20 anos. *Rev Bras Pós-Graduação*. 2015;12(29):683-714.
20. Gama HS, Furtado HL, Silva MM. Levantamento do perfil do pesquisador fisioterapeuta nos programas de pós-graduação em educação física no Brasil. *Cad Educ Saúde e Fisioter*. 2017;4(8):67-8.
21. Forjaz CLM, Corrêa UC, Tricoli VAA. 40 anos da pós-graduação da EEFÉ-USP: uma autocrítica. *Rev Bras Educ Física e Esporte*. 2017;31(nesp):81-7.
22. Ferreira L. Assessoria fonoaudiológica aos profissionais da voz. In: Ferreira L, Befi-Lopes DM, Limongi SCO (eds). *Tratado de fonoaudiologia*. São Paulo: Roca; 2004. p. 138-49.

23. Silva APL, Pedroza FJA, Sobral NV, Bufrem LS. Indicadores científicos, tecnológicos e acadêmicos: uma proposta para a Univasf a partir das demandas institucionais. *Informação Soc Estud.* 2018;28(3):95-114.
24. Dias PM, Moreira THJ, Dias TMR, Moita GF. Um estudo sobre a produção científica do conjunto de docentes dos programas de pós-graduação da área interdisciplinar no Brasil. *Pesqui Bras em Ciência da Informação e Bibliotecon.* 2018;13(1):109-16.
25. Berberian AP, Krüger S, Guarinello AC, Massi GAA. A produção do conhecimento em fonoaudiologia em comunicação suplementar e/ou alternativa: análise de periódicos. *Rev. CEFAC.* 2009;11(supl2):258-66.
26. Hayashi MCPI, Silva MR, Hayashi CRM, Ferreira Júnior A, Faria LIL. Competências informacionais para utilização da análise bibliométrica em educação e educação especial. *ETD - Educ Temática Digit.* 2005;7(1):11-27.
27. Vieira PVM, Wainer J. Correlações entre a contagem de citações de pesquisadores brasileiros, usando o Web of Science, Scopus e Scholar. *Perspect em Ciência da Informação.* 2013;18(3):45-60.
28. Farias SA. Internacionalização dos periódicos brasileiros. *Rev Adm Empres.* 2017;57(4):401-4.
29. Almeida RMVR, Gave N, Catelani F, Bruno S, Bergamini BC, Huggenin FM et al. Comparing impact factors from three databases: Web of Science, Scopus and SciELO. *Cad Saúde Colet.* 2010;18(2):323-6.
30. Chiari BM, Ferreira LP, Behlau M, Russo ICP. Editorial - o que é o prêmio mérito fonoaudiológico: depoimentos. *Rev da Soc Bras Fonoaudiol.* 2008;13(3):xxiii-xxiv.