

# Scientific production in the journal Distúrbios da Comunicação between 2016 and 2020

## A produção científica na revista Distúrbios da Comunicação entre 2016 e 2020

## Producción científica en la Revista Distúrbios da Comunicação entre 2016 y 2020

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### Abstract

**Introduction:** Discussions on the production of science, especially on scientific productivity, contribute to the planning and improvement of research and professional qualification. **Objective:** To evaluate the publication of original articles of the Revista Distúrbios da Comunicação from 2016 to 2020, comparing with previous research results. **Method:** Documentary research, carried out through a bibliometric study of articles from the collection of the following data: volume and number of the journal, title, abstract, institution of the authors, with respective record of the geographic region of the first author, descriptors, topics, study design, number of research centers, and size and age of the sample. There was a descriptive, numerical and percentage analysis of the data. **Results:** 258 original articles were analyzed and the most frequent subjects were related to Hearing and Balance (80;31.1%), followed by Language (73;28.3%); type of observational study (199;77.1%), conducted in a single center (254;

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#### Authors' contributions:

LPF, MCBT, ACP: Study conception and design, data collection, analysis of results and article writing.

MFQPB, ALLA, PDMF, MMFB, RNS: Data collection, analysis of results and article writing.

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**Received:** 9/16/2021

**Accepted:** 11/12/2021

98.4%), with an average sample size of 74.3 subjects, in the prevalent age group from 19 to 59 years (119;46.1%). **Conclusion:** As basic areas of Speech-Language Pathology, Hearing and Balance and Language are the areas with the highest number of studies. The increase in the number of studies in the areas of Dysphagia and Collective Health suggests an important movement of consolidation of more recently constituted fields. There is a need for Graduate Programs and research centers to promote strategic actions that enhance multicentric research and expand the development of intervention studies. Special attention should be given to the selection of descriptors by the authors, in order to facilitate access and, consequently, produce greater impact for the research and for the area.

**Keywords:** Speech, Language and Hearing Sciences; Education; Research; Publication for Scientific Dissemination; Periodical; Scientific Publication Indicators.

## Resumo

**Introdução:** Discussões sobre a produção da ciência, em especial sobre a produtividade científica, contribuem para o planejamento e aperfeiçoamento da pesquisa e formação. **Objetivo:** Analisar a publicação de artigos originais da Revista Distúrbios da Comunicação no período de 2016-2020, comparando com resultados de pesquisa anterior. **Método:** Pesquisa documental, realizada por meio de estudo bibliométrico de artigos a partir da coleta dos seguintes dados: volume e número da revista, título, resumo, instituição de origem dos autores, com respectivo registro da região geográfica do primeiro autor, descritores, áreas temáticas, tipo de estudo, número de centros de pesquisa, e tamanho e faixa etária da amostra. A análise dos dados foi descritiva, numérica e percentual. **Resultados:** Foram analisados 258 artigos originais e os assuntos mais frequentes envolviam a temática de Audição e equilíbrio (80;31,1%), seguida de Linguagem (73;28,3%); tipo de estudo observacional (199;77,1%), realizados em um único centro (254; 98,4%), com tamanho médio de amostra de 74,3 sujeitos, na faixa etária prevalente de 19 a 59 anos (119;46,1%). **Conclusão:** Como áreas basilares da Fonoaudiologia, Audição e Equilíbrio e Linguagem são as áreas com mais pesquisas. O aumento de pesquisas, nas áreas de Disfagia e Saúde Coletiva aponta para o importante movimento de consolidação de campos mais recentemente constituídos. Constata-se a necessidade de Programas de Pós-Graduação e centros de pesquisa promoverem ações estratégicas que potencializem pesquisas multicêntricas e ampliem o desenvolvimento de estudos de intervenção. Recomenda-se atenção especial para a escolha de descritores para facilitar o acesso e produzir consequentemente maior impacto para a pesquisa e para a área.

**Palavras-chave:** Fonoaudiologia; Educação; Pesquisa; Publicação para Divulgação Científica; Publicação Periódica; Indicadores de Publicação Científica.

## Resumen

**Introducción:** Los debates sobre la producción de ciencia, especialmente sobre la productividad científica, contribuyen a la planificación y mejora de la investigación y la formación. **Objetivo:** analizar la publicación de artículos originales de la Revista Distúrbios da Comunicação en el período 2016-2020, comparando con resultados de investigaciones anteriores. **Método:** Investigación documental, realizada a través de un estudio bibliométrico de artículos de la recopilación de los siguientes datos: volumen y número de la revista, título, resumen, institución de origen de los autores, con registro respectivo de la región geográfica del primer autor, descriptores, áreas temáticas, tipo de estudio, número de centros de investigación, y tamaño y edad de la muestra. El análisis de los datos fue descriptivo, numérico y porcentual. **Resultados:** Se analizaron 258 artículos originales y los sujetos más frecuentes fueron el tema Audición y equilibrio (80;31,1%), seguido de Lenguaje (73;28,3%); tipo de estudio observacional (199;77,1%), realizado en un solo centro (254; 98,4%), con un tamaño muestral promedio de 74,3 sujetos, en el grupo de edad prevalente de 19 a 59 años (119;46,1%). **Conclusión:** Como áreas básicas de logopedia, Audición y Equilibrio y Lenguaje son las áreas con más investigación. El aumento de la investigación en las áreas de Disfagia y Salud Colectiva apunta al importante movimiento de consolidación de campos más recientemente constituídos. Se observa la necesidad de programas de posgrado y centros de investigación para promover acciones estratégicas que potencien la investigación multicéntrica y amplíen

el desarrollo de los estudios de intervención. Se recomienda prestar especial atención a la elección de descriptores para facilitar el acceso y, en consecuencia, producir un mayor impacto para la investigación y, en consecuencia, para el área.

**Palabras clave:** Fonoaudiología; Educación; Investigación; Publicación para Divulgación Científica; Publicación Periódica; Indicadores de Publicación Científica.

## Introduction

Science can be understood as a broad social system that produces studies and research, operating concepts, methodology, and technologies, aiming to build data to later transform them into information, generating knowledge, which is the main element for development<sup>1</sup>. Scientific research, which is a fundamental instrument of science, and its dissemination are inseparable activities and, to fulfill its purpose, the research needs to be made available and peer-reviewed in a scientific community. In this way, the knowledge produced and disseminated can resonate, affecting the qualification in scientific production, in professional activities and, consequently, in life in society. Therefore, the dissemination of scientific knowledge is currently an important indicator of social impact<sup>2</sup>.

With the emergence of the internet, scientific journals have become the fastest, most agile and cost-effective way of disseminating research results in different areas of knowledge<sup>3</sup>. Due to their contribution to development, journals are currently considered the largest open vehicle for communicating scientific production<sup>3</sup>, both for updating and publicizing research, as well as for popularizing scientific advances. The development of science in the field of Speech-Language Pathology has increased significantly in recent decades, especially from the creation of Graduate Programs and with the consolidation of the oldest and most traditional periodicals in the area and the internationalization of production<sup>4</sup>.

Of course, production related to the area is also promoted in other journals, but as they are published by scientific entities or courses responsible for the training of speech-language pathologists, most of the Brazilian scientific production in Speech-Language Pathology is published in four specific and representative journals. *Revista Distúrbios da Comunicação* (DIC), which was created in 1986 under the management of the Graduation Program of the Undergraduate Course in Speech-Language Pathology and the Division for Education

and Rehabilitation for Communication Disorders (DERDIC) of the Pontificia Universidade Católica de São Paulo; the *Communication Disorders, Audiology and Swallowing (CoDAS)* journal of the Brazilian Society of Speech-Language Pathology and Audiology (SBFa), which was created in 2013 to continue the production of the *Jornal da Sociedade Brasileira de Fonoaudiologia*, created in 2011, also by the SBFa, following up on *Revista de Atualização Científica Pró-Fono*, which was started in 1989; *Revista CEFAC*, which was created in 1999 and initially belonged to the Specialization Center in Speech Language Pathology and, as of 2016, became part of the Brazilian Association of Orofacial Motricity (ABRAMO); and, finally, the *Audiology - Communication Research (ACR)*, which is a technical-scientific publication of the Brazilian Academy of Audiology (ABA) since 2013, continuing the *Revista da Sociedade Brasileira de Fonoaudiologia*, which was first published in 1997.

Among other characteristics, these journals currently provide open access communication, which is fundamental for the democratization and popularization of scientific production in the area, since dissemination results in an impact beyond the scientific community, reaching the non-specialized public. This convergence of academic and non-academic audiences, as provided by the electronic means of publication, results in a new audience for science<sup>5</sup>. Thus, greater visibility provides the recognition of the society for the value of science and promotes greater participation by society in the formulation of public policies.

The analysis of scientific production has been carried out as a way to assess scientific development and innovation in different areas of knowledge. Among other ways, this analysis of scientific production can be carried out by analyzing the bibliographic production of Graduation Programs, annals of scientific events, or consulting the database or the content of journals. In the field of Speech-Language Pathology and Audiology, this type of study has been understood as an important

resource for the process of building a memory and reflection on the state-of-the-art of a given topic aiming at improving knowledge, as the internal critique of the area's production is a condition for the development of the knowledge produced to be incorporated by the community, thus fulfilling its transforming role<sup>6</sup>.

Literature has several types of reviews (such as narrative, integrative, and systematic reviews) of the scientific production of the area on a certain topic, or on a field of professional activity<sup>7,8</sup>. However, the production of knowledge has been investigated by more comprehensive analyses, based on trends or point to advances and gaps observed in the production of the area<sup>6</sup>. This includes bibliometric studies, which highlight quantitative aspects of scientific production, dissemination, and use of recorded information, providing predictions and support for decision-making. Among other actions, these studies include: the mapping of scientific activities of professors by institutions (generally public and graduation)<sup>9,10</sup>, by title<sup>10</sup>; highlights for the production of works registered in the annals of events held by scientific societies<sup>8</sup>; characterizations and analysis of quality indicators as an impact factor for journals<sup>4,11</sup>; or reports of the most cited or accessed productions<sup>4</sup>. On the other hand, other studies discuss the profile of researchers who receive public resources for research, contributing to public policies<sup>12</sup>. Many studies also characterize the most studied topics by the area using keywords<sup>13</sup>.

In addition, there is also the analysis of publication in journals, which is sometimes carried out by researchers in prospecting trends, through the characterization of research (topics, age groups, types of interventions and institutional contexts)<sup>6</sup>, and at other times by editors, as well as this study, in an attempt to improve the planning of the entire publishing process. In 2018, Ferreira et al.<sup>14</sup> analyzed the articles published from 2012 to 2016, in the *Revista Distúrbios da Comunicação*, according to the following variables: topic, type of research (literature review, observational or interventional study), number of study centers involved and descriptors. Among other issues, the findings showed that the DIC journal managed to expand its scope with the expressive participation of educational institutions from different regions of Brazil and pointed out relevant issues to be considered when choosing descriptors<sup>13</sup>. Continuing this research, the editors of the same journal decided to update

the analysis in order to draw a comparison with the study carried out previously. Thus, this study aims to raise points of discussion and draw the attention of researchers about the scientific production in the area and how it is presented in this journal, as well as establishing goals to be achieved in the coming years, with a view to increasingly improving the quality of the DIC journal. Therefore, this study aims to analyze the publication of original articles in the *Revista Distúrbios da Comunicação* from 2016 to 2020 to compare with the results of a previous research.

## Method

This is a bibliometric study that, by its nature, does not require submission to the Ethics Committee.

The search was carried out on the website where the articles are available (<https://revistas.pucsp.br/dic>) for the period of analysis of 5 years, between January 2016 and December 2020, referring to volumes 28 a 32, with approximately 60 articles in each volume. The variables and criteria established for the analysis of each of them were defined and then the selected material was downloaded (by volume and number), and the data were entered into an Excel spreadsheet.

The collection prioritized the variables corresponding to the following data: volume and number of the journal, title, abstract, institution of the authors with respective registration of the geographical region of the first author; descriptors; topic, considering the seven areas established by the Brazilian Society of Speech-Language Pathology and Audiology (Hearing and Balance, Dysphagia, Educational Speech-Language Pathology, Language, Orofacial Motricity, Public Health and Voice), adding the category of Professional Training; Study design (observational, interventional or review); number of study centers involved (single or multicenter); and, finally, size and age range of the sample (0-6 years, 7-11 years, 12-18 years, 19-59 years and aged over 60 years)<sup>15,16</sup>. Initially, all articles registered in the original articles section were selected, but literature reviews were later excluded.

Data were subjected to statistical analysis using SPSS v.23 for Windows, which prioritized description by means of absolute (n) and relative (%) frequency, in addition to central tendency (mean

and median) and dispersion (standard deviation, minimum and maximum) measures.

## Results

Over the period analyzed, 297 articles were published, including 39 (13.1%) literature reviews (of different types) and 258 original articles with data collection records (86.9%), the latter being the object of this study.

The distribution per year was similar (approximately 20%/year) and the most frequent subjects were related to Hearing and Balance (80; 31.1%), followed by Language (73; 28.3%).

As for the study design, there was a greater number of observational studies (199; 77.1%), mostly carried out in a single center (254; 98.4%), with an average sample size of 74.3 subjects (SD=142.9), median age of 30, ranging between 1 and 879 subjects, within the age group from 19 to 59 years (119; 46.1%). (Table 1)

**Table 1.** Number and percentage of articles published in DIC, according to study characteristics.

Variables	Categories	n	%
Year of Publication	2016	55	21.2
	2017	51	19.8
	2018	52	20.2
	2019	50	19.4
	2020	50	19.4
Topic*	Voice	36	14.0
	Language	73	28.3
	Hearing and Balance	80	31.1
	Oral Motricity	30	11.6
	Dysphagia	27	10.5
	Educational Speech-Language Pathology	26	10.1
	Collective Health	47	18.2
	Professional Training	10	3.9
Study design	Observational	199	77.1
	Interventional	59	22.9
Number of study centers	Single-center	254	98.4
	Multicenter study	4	1.6
Age Range*	0-6 years old	80	20.8
	7-11 years old	60	15.6
	12-18 years old	58	15.0
	19-59 years old	122	31.7
	≥ 60 years old	65	16.9

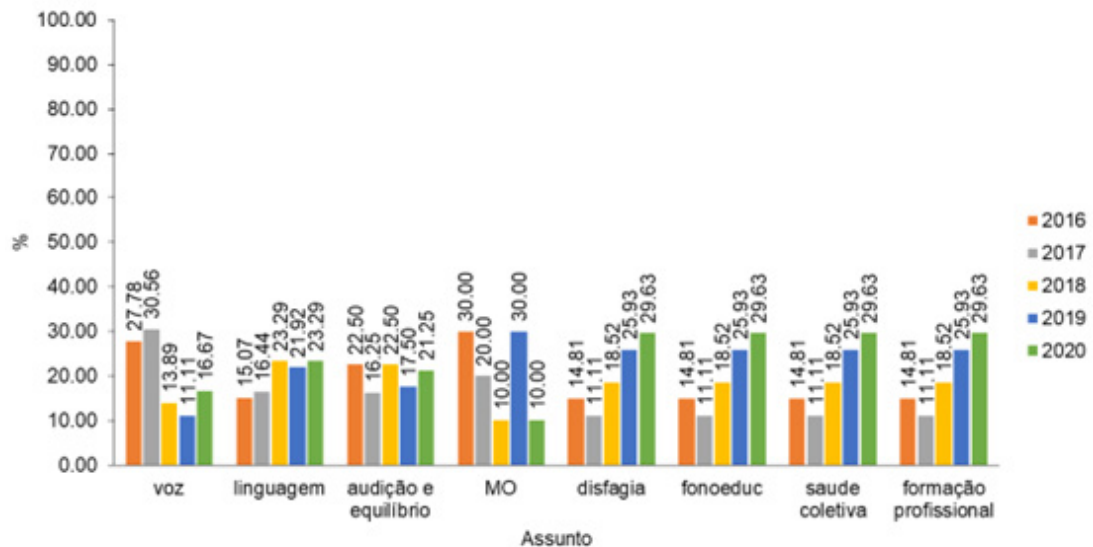
\* Independent analysis of each variable.

Table 2 and Figure 1 show that there was a higher frequency of articles on Voice and Oral Motricity between the first two years analyzed.

**Table 2.** Number of articles by topic, by year of publication.

Variables	Categories*	Voice	Language	Hearing and Balance	OM	Dysphagia	Educational SLP	Collective Health	Professional Training
	Year	10	11	18	9	4	9	14	2
	2017	11	12	13	6	3	4	6	2
	2018	5	17	18	3	5	4	7	3
	2019	4	16	14	9	7	6	8	3
	2020	6	17	17	3	8	3	12	0
TOTAL		36	73	80	30	27	26	47	10

\* análise independente de cada variável



**Figure 1.** Chart of distribution of topics, according to the year of publication.

As for the production by study center, studies were found in 46 different Higher Education Institutions (HEIs), centers or care services. Table 3 shows the ten HEIs with the highest number of

articles in the analyzed period, especially PUC-SP (42;16.3%), UFSM (28;10.9%) and UFMG (23;8.9%).

**Table 3.** Descriptive analysis of articles, according to the year of publication and HEI\* involved.

Institution	2016		2017		2018		2019		2020		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Pontifícia Universidade Católica de São Paulo – PUC-SP, São Paulo, SP, Brasil	12	21.8	8	15.7	9	17.3	4	8.0	9	18.0	42	16.3
Universidade Federal de Santa Maria – UFSM – Santa Maria – RS - Brasil	6	10.9	6	11.8	7	13.5	9	18.0	0	0.0	28	10.9
Universidade Federal de Minas Gerais - UFMG, Minas Gerais, Brasil	5	9.1	6	11.8	3	5.8	4	8.0	5	10.0	23	8.9
Universidade Federal de Sergipe – UFS, Sergipe, Brasil	7	12.7	6	11.8	4	7.7	2	4.0	1	2.0	20	7.8
Universidade Estadual de Campinas- UNICAMP, Campinas, SP, Brasil	3	5.5	1	2.0	6	11.5	2	4.0	3	6.0	15	5.8
Universidade Estadual Paulista – UNESP – Marília - SP - Brasil	3	5.5	0	0.0	1	1.9	4	8.0	2	4.0	10	3.9
Faculdade de Odontologia de Bauru, Universidade de São Paulo – FOB-USP, Bauru, SP, Brasil	2	3.6	2	3.9	3	5.8	1	2.0	1	2.0	9	3.5
Universidade Estadual de Ciências da Saúde de Alagoas – UNCISAL, Maceió, AL, Brasil	0	0.0	0	0.0	4	7.7	1	2.0	4	8.0	9	3.5
Universidade Estadual do Centro-Oeste - UNICENTRO, Irati, PR, Brasil	0	0.0	1	2.0	1	1.9	4	8.0	2	4.0	8	3.1
Universidade Federal Ciências da Saúde de Porto Alegre-UFCSPA, Porto Alegre, RS, Brasil	1	1.8	0	0.0	0	0.0	3	6.0	4	8.0	8	3.1

\* Related to the first author

Only one article carried out in an international HEI was found and Tables 4 and 5 record data in which the geographic region (Brazil), of the first author of the articles (total – 257), was analyzed considering the year of publication and the researched topic.

There was no record referring to the North region, and most authors were related to HEIs in the Southeast (132; 51.3%) and South (73;28.4%) regions, especially in the States of São Paulo (97; 73.4%) and Rio Grande do Sul (50; 68.4%), respectively.

As 60 articles are published per year (including review), the analysis according to the year of publication of the articles shows that there is a greater publication of articles referring to the Central-West,

Northeast and Southeast regions at the beginning of the period analyzed, while numbers in the South region increase from 2019. It should be noted that there was a decrease in the publication of articles in the Northeast region in the same year.

As for the topic addressed by the authors, there are few records on studies in the Central-West region and none of them address Hearing and Balance, OM and Dysphagia; while studies from the Northeast region prioritize Hearing and Balance and Public Health (each -12; 25.0%); studies in the Southeast region are focused on Hearing and Balance (45; 34.4%) and Language (34; 25.8%); and, finally, studies from the South region mainly address Language (28; 38.4%) and Hearing and Balance (23; 31.5).

**Table 4.** Descriptive analysis of the analyzed articles, according to geographic region and year of publication.

Ano		Region				Total
		Central-West	Northeast	Southeast	South	
2016	n	0	13	31	11	55
	%	0.0	27.1	23.5	15.1	21.4
2017	n	2	9	23	16	50
	%	50.0	18.8	17.4	21.9	19.4
2018	n	0	11	29	12	52
	%	0.0	22.9	22.0	16.4	20.2
2019	n	1	4	23	22	50
	%	25.0	8.3	17.4	30.1	19.4
2020	n	1	11	26	12	50
	%	25.0	22.9	19.7	16.4	19.4
Total	n	4	48	132	73	257
	%	100.0	100.0	100.0	100.0	100.0

**Table 5.** Descriptive analysis of the analyzed articles, according to geographic region and topic addressed.

Topics		Regions*				Total
		Central-West	Northeast	Southeast	South	
Voice	n	2	6	22	5	35
	%	50.0	12.5	16.7	6.8	14.0
Language	n	1	10	34	28	73
	%	25.0	20.8	25.8	38.4	28.3
Hearing and Balance	n	0	12	45	23	80
	%	0.0	25.0	34.4	31.5	31.1
OM	n	0	10	10	10	30
	%	0.0	20.8	7.6	13.7	11.6
Dysphagia	n	0	3	13	11	27
	%	0.0	6.3	9.8	15.1	10.5
Educational SLP	n	1	3	18	4	26
	%	25.0	6.3	13.6	5.5	10.1
Collective Health	n	2	12	27	6	47
	%	50.0	25.0	20.5	8.2	18.2
Professional Training	n	2	3	3	2	10
	%	50.0	6.3	2.3	2.7	3.9

\* Independent analysis of each variable

In turn, 454 different terms were registered in the analysis of descriptors, which are represented in the word cloud in Figure 2. The Chart in Figure 3 shows the descriptors that were mentioned five or

more times (total of 20 descriptors), with emphasis on Hearing Loss (8), Speech-Language Pathology (6) and Elderly (6).





## Discussion

Since it is possible to compare the data found with the analysis carried out previously (2012-2016), the results for the period analyzed (2016-2020) show some aspects that should be highlighted<sup>14</sup>. In addition to providing data that enable editors to review some actions and plan future goals, the findings provide a scientific contribution to decision-making and reflections to be considered by researchers allocated to Graduation Programs and Courses, as well as for independent researchers.

Initially, it should be noted that DIC complied with its periodicity and number of publications with approximately 60 articles in each volume (with a total of 297 articles in the 5 volumes from 2016 to 2020), which are criteria established by the Scielo platform for journals in the field of Health, even though they are not yet part of this collection<sup>17</sup>.

When comparing the two periods evaluated, there is a similarity regarding this data (285 and 297 articles published, respectively), which allows us to state that these criteria (frequency and total number of articles) have been met in the last ten years. Thus, it is essential to make efforts to maintain the publications of this journal, as well as seek a better classification, as it is one more possibility of publishing research findings that consequently result in important reflections and discussions for Speech-Language Pathology and Audiology in its relationship with other areas, which is a priority for any scientific journal.

Over the period analyzed, the average time between article submission and publication was 6.48 months (median of 6.4), with a minimum of 4.8 months and a maximum of 6.9 months (SD=2.47), which also strengthens the issue presented above, as it allows authors who submit their articles to have their research published and disseminated in less time and in a faster manner. It should be noted that the involvement of Doctoral students from the Graduation Program in Human Communication and Health at PUC-SP in the editing process, specifically in the stage of checking the articles when submitted and the monitoring of the analysis process by the reviewers, has helped the editors of the magazine to speed up the processes, as well as providing a distinct training to these students.

As for the topics addressed and prioritized by the authors, the articles addressed all topics defined for analysis, with emphasis on Hearing and Balance

(31.1%) followed by Language (28.3%). In turn, these two areas changed position in the previous analysis (in a greater number of articles on Language (38.8%)<sup>14</sup>, followed by 22.4% on Hearing and Balance), which reinforces that these two areas are the basis of beginnings of Speech-language pathology, and that they remain so until today. In an article that analyzed the topics developed by Brazilian Ph.D. speech-language pathologists when presenting their theses (1125 in total), these two areas were also reported as the most prevalent (Language, 35.2%; and Audiology, 26.0%). The “Language” area is also the most frequent in the analysis of annals presented at the Congresses of the Brazilian Society of Speech-Language Pathology and Audiology<sup>8</sup>, while the area of “Hearing and Balance” certainly has few mentions for having another specific event for the works to be presented (meetings of the Brazilian Academy of Audiology. Compared to the period analyzed above<sup>14</sup>, there was a smaller number of articles submitted in some areas (and probably lower approval), such as Voice (23.6% versus 14.0%), while there was an increase in other areas, such as Dysphagia (4.0% versus 10.5%) and Public Health (13.2% versus 18.2%).

As for the choice of the study design selected to meet the authors’ objectives, there is a greater record of observational studies (77.1%) compared to interventional studies (22.9%)<sup>18,19</sup>. Although important, especially in epidemiological studies, in observational studies the researcher must observe the researched subject, the characteristics of a given disease or its evolution, with the objective of applying some action to intervene or modify in real time<sup>19</sup>. However, it is worth noting that intervention studies make it possible to evidence the effects of a given action, providing scientific evidence of benefits achieved in interventions, reinforcing the relevance of the area involved<sup>18</sup>.

There are few initiatives regarding the carrying out of multicenter studies, which should be reflected by the area. By bringing together different institutions for data collection, multicenter studies allow larger samples and case studies (megatrials). They require a more complex elaboration of protocols, as well as training and integration of teams, in addition to providing exchange of experiences and knowledge<sup>20</sup>. By addressing a greater diversity in population characteristics, the sample is more representative, which results in greater credibility to the study, as the results become applicable to

the general population, especially considering the territorial extension of Brazil, which encompasses different realities<sup>20</sup>.

As for age groups, which is the goal of the articles analyzed in this study, the percentage of studies related to subjects in the adult phase (from 18 to 59 years old) is surprising, as the study shows that many authors report a high prevalence of speech-language problems in age groups related to the first and second childhood<sup>21</sup>. This same study identified a low rate of referrals of adults and elderly to speech-language pathology care at a Health Center, and attributed this to the lack of knowledge about speech-language pathology work and its areas of expertise and to the popular belief that speech-language pathology is more related to speech disorders in children. The prevalence of studies related to the adult age group found in the analysis presented herein may be related to the change in the Brazilian demographic and epidemiological profile, and the increase in chronic diseases. It may also be related to the opening up of new fields of activity for speech-language pathologists, as was also recorded in this article, with the increase in research involving topics that include the adult age group, such as collective/worker health, dysphagia and professional training, resulting from public policies implemented more recently.

When analyzing the total number of HEIs that submitted their articles to DIC, it is possible to consider that there is a greater number of publications, resulting from a greater number of submissions, of studies carried out by the faculty members and students of PUC-SP, which publishes the journal. This can also be attributed to the longevity of the journal, which since 1986 has become a showcase, bringing together productions from the Speech-Language Pathology and Audiology Course, Term Papers and, mainly, the Institutional Program for Scientific Initiation Scholarships, which completed 30 years this year, and the dissertations and theses of the Program of Postgraduate studies, which is now called Human Communication in Health and that it will complete 50 years in 2022. Similarly, as found in the previous study<sup>14</sup>, both PUC-SP and UFSM have a greater number of studies in the field of Language according to their profiles.

It is also worth highlighting the similarity in the comparison with a study carried out in the previous period<sup>14</sup> (the previous study found 45 studies in the area of language, while the current

study found 46). However, only one of the articles was submitted by international researchers in the current period analyzed. The internalization of studies has been encouraged by development agencies, mainly by the Coordination of Improvement of Higher Education Personnel (CAPES), which is responsible for evaluating Graduation Program<sup>2,12,13</sup>. Although the internationalization of national journals is inevitable, the area is still at an early stage and this should be a goal for the four journals in Speech-Language Pathology and Audiology highlighted in the introduction, so that we can leverage our recognition.

Once again, according to the adopted criterion, no study was submitted from a HEI located in the North region of Brazil for the period analyzed, even though the region currently has 10 training courses in Speech-Language Pathology and Audiology, eight in Amazonas and two in Roraima<sup>22</sup>. Once again, the Southeast and South regions had a greater number of submissions, certainly due to the significant presence of existing courses in these regions (respectively 29 and 19) and for having the first Graduation Program in the area<sup>14</sup>. The increasing number of HEIs in the Northeast Region (21) and the creation of Graduation Program in the area 21 of CAPES (in which Speech-Language Pathology and Audiology is inserted and, therefore, evaluated)<sup>23</sup> may be the main cause for the expressive percentage of one-fifth of the analyzed production in this region<sup>12</sup>. On the other hand, despite the low number of HEIs (four), the Central-West Region registered an increase in the number of submissions, increasing from two, in the previous analysis, to four at this time, on different topics<sup>14</sup>. There are alternatives for qualifying researchers in regions with fewer publications, competing in public notices for Interinstitutional Master's Degree (Minter) and Interinstitutional Doctoral Degree (Dinter), published by CAPES, which provide partnerships with consolidated Graduation Programs<sup>24</sup>.

In the analysis of articles in line with the HEIs, there is a participation of some Research Groups, especially those listed in the Directory of Research Groups in Brazil of the National Council for Scientific and Technological Development (CNPq)<sup>12</sup>. Thus, more than the HEIs, the Research Group seems to be the most responsible for the submission of articles and their representation in this analysis<sup>12</sup>. A more careful investigation shows that those studies that address specific themes, such as

the Human Sciences, or studies that have a research profile in which subjectivity is based on consistent methodological strategies and that emphasize research of a qualitative nature, are approved when submitted to DIC. In other words, these researchers understand that DIC is more focused on Health and Human Sciences.

If there is enthusiasm up to this moment, there is also a concern that permeates not only the field of Speech-Language Pathology and Audiology, but all those that need research for their livelihood. The limited budgets allocated to the research area and the consequent cut in funding and scholarships worry Brazilian researchers, who foresee a very challenging future for the coming years. This situation will certainly affect the production of Graduation Program and, consequently, of journals whose mission is to disseminate research<sup>25, 26</sup>.

As for the descriptors, all the descriptors highlighted in the results of Figures 2 and 3 are aimed at the Health Sciences area, which demonstrates the attention and care of the authors and editors of the DIC journal with regard to the accessibility of the articles. The descriptor “*hearing loss*”, with the highest percentage of use, is no longer being replaced by the keyword “*hearing impairment*” as reported in previous times<sup>27</sup>. However, the descriptor “*Speech-Language Pathology*”, which is the second most reported descriptor in the articles in this study (and the first in the previous study), is still used indiscriminately, which shows that it is not directly related to the researched content. When a descriptor is used in place of another without assigning specificity in relation to the main content analyzed in the article, even according to the nomenclature of the databases, it results in a barrier for the user to achieve greater objectivity, when seeking to refine, expand or enhance the study<sup>28</sup>. The use of terms that are added to descriptors, called qualifiers, help to define different aspects and concepts discussed by those responsible for the article. Thus, the descriptor “*elderly*” is reported as the third most used, ahead of “*adult*”, which corresponds to the age group of most published studies. As previously reported, the prevalence of this descriptor certainly reflects the demographic and epidemiological transition process of the Brazilian population and public policies aimed at quality of life. Terms related to age group, which are commonly called secondary descriptors, pre-coded by the indexing system, delimit the target

population of the study, describe or qualify the subject addressed, further detailing the main descriptor of the study. This provides the user with a multidisciplinary and interdisciplinary view of the researched aspects.

When comparing the most frequent descriptors in this analysis with the descriptors highlighted in a previous study, nine descriptors stand out among the most reported (Speech-Language Pathology, voice, hearing loss, hearing, speech, language development, voice disorders, elderly, and language). It should be noted that some terms, such as Voice, Hearing, Speech and Language, reflect functions developed on by the field of Speech-Language Pathology and are appropriately used as primary descriptors, as well as Disorders and Therapy<sup>29</sup>. Always organized in three languages (Portuguese, English and Spanish), the descriptors promote an exchange of research lines at an international level, in addition to preventing the study from deviating from the subject.

## Conclusion

In different positions according to different studies, Hearing and Balance and Language are frequently reported as the two main base areas of the object of Speech-Language Pathology and Audiology. Furthermore, the increase in the number of studies in the areas of Dysphagia and Public Health suggest an important movement towards the consolidation of more recent fields. Among other issues, the study also reported the need for Graduation Program and research centers to promote strategic actions that enhance multicenter studies and expand the development of intervention studies within the speech-language pathology field. These actions can result in important changes aimed at greater recognition of the resolution of problems achieved by professionals in the field, as well as in scientific and technological production and innovation. Special attention should be given to the selection of descriptors by the authors, in order to facilitate access and, consequently, produce greater impact for the research and for the area.

The results encourage the planning of strategies to improve the editing of the DIC journal, as well as guidance for better qualification of future researchers in transforming their research into articles, since, with technological advances, this

task allows for exchanges with researchers from different regions.

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