

Review Article

## Overview of Research in Speech-Language Pathology: Trends in Colombia

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### ABSTRACT

The objective of this article is to explore the research landscape of the discipline at an academic level in the country, by analyzing the research output, in order to identify populations, areas, and research approaches, and in this way determine the needs and challenges of research in Speech-Language Pathology training programs in Colombia. Information from undergraduate and graduate research projects completed between 2010 and 2019 and belonging to 13 Speech-Language Pathology training programs in the country was analyzed. Data were collected from reports and research papers (N=638). Firstly, an increase in research output between 2010 (4.9%) and 2019 (18.3%) was observed, with 85% of the research carried out at an undergraduate level and 15% at a postgraduate level. The predominant approach was qualitative (55.3%), which, together with the descriptive method (77.8%) represents the majority of the research output found. The leading scenario for research is the field of clinical health care (52.9%). The predominant areas in this research scenario are language (29.1%) and hearing rehabilitation (27.4%) in adults (56.7%) and children (28.52%). It is concluded that there is a need regarding the research output at an academic level, specifically in training programs for speech-language pathologists in Colombia, to promote experimental and analytical research, in newborns and infants and in areas related to oral-motor function and unexplored scenarios. Furthermore, it is necessary to include the use of technologies and new intervention approaches to contribute to evidence-based practices. Future research should allow comparing investigations carried out before and after the pandemic, given the process of virtualization that occurred during that time and the inclusion of speech therapy in settings such as critical care and palliative care units.

### Keywords:

Research; Speech  
Language Therapy; Trends

## Panorama de la investigación en fonoaudiología: tendencias en Colombia

### RESUMEN

El objetivo de este artículo es analizar el panorama investigativo disciplinar desde la producción académica nacional, para identificar poblaciones, áreas, enfoques de investigación, de esta manera reconocer necesidades y retos para la investigación formativa de la fonoaudiología en Colombia. Se analizó información proveniente de proyectos de investigación de pregrado y posgrado de 13 programas de formación en Fonoaudiología del país, entre 2010 y 2019, reportados por las instituciones de educación superior. Se recolectó información de informes y documentos de investigación (N=638). En primer lugar, se observa un incremento en la producción investigativa entre 2010 (4,9%) y 2019 (18,3%). El 85% de la investigación se identificó en pregrado y el 15% en postgrado. El enfoque predominante fue cualitativo (55,3%), el que, junto con el alcance descriptivo (77,8%) que representan la mayoría de productos de investigación. El escenario relacionado con el ámbito de salud clínico asistencial lidera la investigación (52,9%). Las áreas predominantes en este escenario investigativo son Lenguaje (29,1%) y Audición (27,4%) en poblaciones de adultos (56,7%) e infantil (28,52%). Se concluye que la producción investigativa desde la academia, específicamente desde los programas de formación de fonoaudiólogos en Colombia, evidencian la necesidad de fomentar la investigación de tipo experimental y analítica, con poblaciones de neonatos y lactantes, en áreas relacionadas con la función orofaríngea y en escenarios inéditos. Además, es necesario incluir el uso de tecnologías y nuevos enfoques de intervención para aportar al abordaje basado en la evidencia. Futuras investigaciones deben permitir comparar la investigación antes y después de la pandemia, dada la virtualización y la inclusión de la fonoaudiología en escenarios como las unidades de cuidado crítico y cuidado paliativo.

### Palabras clave:

Investigación;  
Fonoaudiología;  
Tendencias

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## INTRODUCTION

Research, as an activity originating in academic contexts, allows students, teachers, professionals, and associations to contribute to history and update their scientific and curricular lines of work. According to Lizarazo-Camacho & Fique Ortega (2013), Speech-Language Pathology has managed to earn a space in Colombia in the fields of education and healthcare, as well as in other scenarios such as community and occupational settings, albeit in a rather emergent manner. Academia has played a fundamental role in this process through the development of research, as academic institutions and professional programs consider research a crucial and cross-cutting aspect in the training of professional speech and language pathologists (SLP).

In recent years, and due to transformations occurring at a national level in the reality of the scientific community, Speech and Language Pathology has moved towards different contexts in which the scope of action of these professionals has been reconsidered. This landscape of innovation has allowed for proposing and developing research in diverse scenarios and populations, as well as interacting with other professionals. Furthermore, it has created an opportunity to open new paths to and for research (Maury-Sintjago et al., 2018). According to Cuetos (2020), research is an essential aspect of formative processes, since it represents both an axis for evidence-based practice and a flag that allows for guilds to gain position and to be empowered. Thus, it is conceived as the vital link between academia and professional practice. Additionally, research supports the development of the discipline of speech-language pathology and its professionals in innovative and real environments.

Research in the field of Speech-Language Pathology has evolved, since the object of study (human communication and its disorders) has been recognized, in the new contexts mediated by human needs and technology, as a fundamental aspect of each stage of human development. This broadening of the research landscape responds to new paradigms such as the diversification of stages of the life cycle, where adulthood and aging have been included, and life course approaches are used as a comprehensive perspective of human development (Faber et al., 2020). Interdisciplinary relationships have also fostered shared interests, which translates into doctoral or master's programs proposing research in transdisciplinary topics.

Similarly, research in this field has gained new strength in recent years and has diversified in terms of topics, sources, actors, and settings. This moment in the profession requires an exploration of

the state of research in academic settings, identifying trends and common and divergent lines, along with posing challenges and identifying needs for research in Speech-Language Pathology in Colombia, to respond to the social, economic, and political realities of our country. This analysis has the aim of inviting the academic and clinical community to reflect on the strengths, as well as on the areas that need improvement regarding research in the field. Moreover, it aims to promote the development of studies that encourage future approaches to its object of study.

## MATERIALS AND METHODS

A quantitative-descriptive study was designed (Puyuelo et al., 2010), with the objective of analyzing the characteristics of studies carried out between 2010 and 2019 in the field of speech-language pathology in Colombia. The method used was bibliometrics (Hernández et al., 2010), which allowed for compiling the training programs existing in Colombia to examine both the structure and the dynamics of the research being developed, as well as the growth of scientific output. This methodology followed the guidelines of the integrative review, making it possible to monitor the research output in the country within the established period. The literature was analyzed to understand the phenomenon of research in speech therapy in Colombia, in order to understand interests, approaches, populations, and institutional guidelines used.

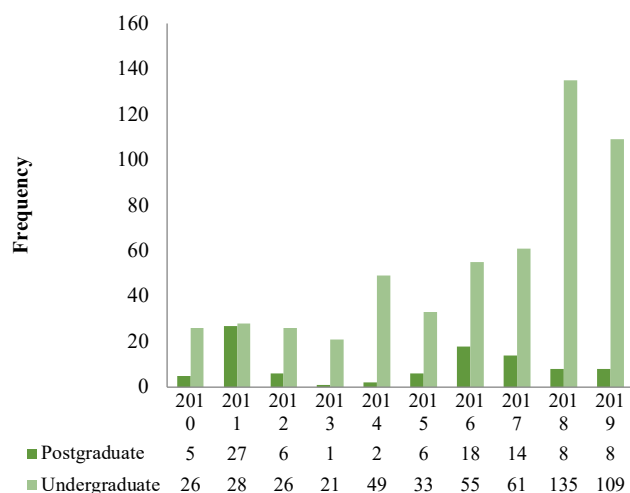
Information provided by 13 speech therapy training programs in Colombia was collected, accessing institutional files, databases, and university repositories. The following types of documents were included in the review: undergraduate reports, theses, and research projects in Speech-Language Pathology, as well as postgraduate studies in departments of Communication Sciences. The review was carried out remotely, given the difficulty of mobilization during the pandemic. Research documents originating from interdisciplinary postgraduate courses were excluded, because of the difficulty in tracking them in the country.

The information collected from each document was tabulated in a matrix that included the following variables: institution, year of publication, level of training, type of study, approach, and scope, as well as scenarios, roles, functions, and professional fields. Subsequently, the data were coded and categorized to facilitate its analysis. Once the matrix was refined, a descriptive analysis was carried out using the SPSS software. Contingency and frequency tables were designed to allow observing the relationships between the selected variables. Productivity comparisons were obtained by year, type and scope, by topic, and by the visibility of the output,

among others. Two types of research were distinguished for the analysis of trends: qualitative and quantitative.

## RESULTS

The information gathered exposes the research projects of 13 training programs in Speech-Language Pathology taught in Colombia. Six hundred and thirty-eight studies were found, corresponding to dissertations, theses, and monographs. The results show a noticeable increase in research output between 2015 and 2019, with an average of 4% annual growth. The year 2018 registered the largest number of studies of the period (see figure 1).



**Figure 1.** Distribution of the research output per year according to the level of the training programs.

Eighty-five percent (85%) of the investigative output corresponds to undergraduate and 15% to postgraduate work. Figure 1 shows that the highest number of undergraduate studies were carried out in 2019 (109 projects), while at a postgraduate level the highest number was carried out in 2011 (27 papers). At the undergraduate level, an increase in production was observed between 2015 and 2018, whereas an increase occurred between 2013 and 2016 in postgraduate research projects. It is noteworthy that 100% of the research collected belonged to the field. Regarding cooperation, 98.3% was developed at an intra-institutional level and 1.7% at an inter-institutional level, with 98.8% being national research and 1% international. Concerning the number of researchers, 36.7%

of the studies were developed by two researchers, 26.5% by three researchers, and 22.4% only by one researcher.

Regarding the methodology, basic research studies predominate (56.6%), with qualitative approaches (55.3%) and descriptive methods (77.8%). The most common designs used correspond to cross-sectional (33.5%) and documentary (17.5%). There was a lower proportion of case studies (5.3%), design of measurement instruments (4.7%), and studies with a phenomenological and quasi-experimental approach (3.6%). For details, see table 1.

**Table 1.** Type, approach, and scope of the research.

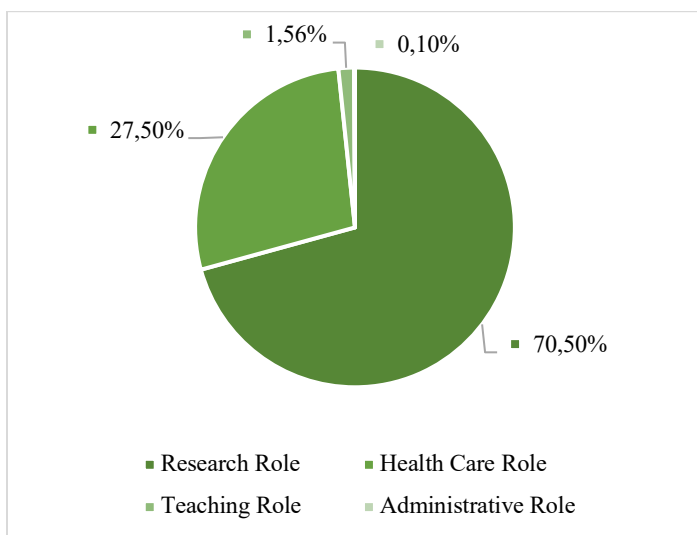
Year	Type		Approach				Scope				
	Applied	Basic	Instrument design	Epidemiological	Qualitative	Quantitative	Mixed	Correlational	Descriptive	Explanatory	Exploratory
2010	9	7	13	2	11	8	12	3	26	0	2
2011	9	26	19	1	40	9	6	5	39	4	7
2012	7	17	7	1	23	4	5	0	22	1	9
2013	5	14	3	0	14	6	2	0	18	0	4
2014	8	29	13	1	30	14	7	3	37	2	9
2015	11	24	2	2	19	8	12	3	30	0	6
2016	21	30	19	3	44	15	14	1	65	2	5
2017	20	43	11	1	42	16	17	5	56	0	14
2018	26	99	11	7	82	43	18	8	116	4	15
2019	20	72	22	3	48	49	20	11	88	2	16
Total	136	361	120	21	353	172	113	39	497	15	87

Table 2 shows that the descriptive and exploratory studies excluded the infant population and worked mainly with older adults. On the other hand, it was observed that the participants in the exploratory studies were mainly adults, in the correlational studies older adults, and that the explanatory studies generally worked with the adult population as well.

**Table 2.** Regressions between predictors and variables of interest.

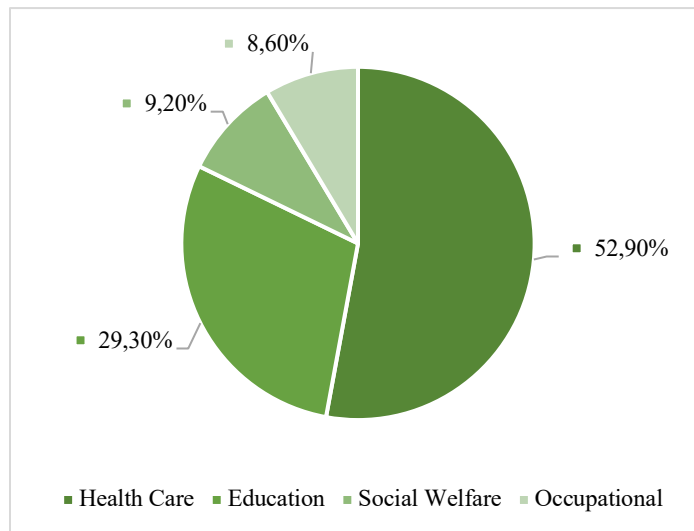
Population	Scope			
	Correlational	Descriptive	Explanatory	Exploratory
Adolescents	1	18	0	2
Adults	2	21	2	6
Older adults	3	36	0	5
Toddlers	2	8	1	2
Older infants	0	1	0	0
Young infants	0	1	0	0

Figure 2 shows that the predominant roles that are studied are investigative (70.5%) and health care (27.5%) roles. The teaching role (1.56%) and the administrative role (0.1%) are less predominant. Studies that involve the teaching role emerge in 2014.



**Figure 2.** Roles in research.

Similarly, the scenarios of greatest interest are health care (52.9%) and education (29.3%), whilst the scenarios of social welfare (9.2%) and occupation (8.6%) are studied to a lesser extent. Studies were carried out in the health care and education scenarios throughout the analysed period, while research on social welfare is registered starting in 2011 (see figure 3).



**Figure 3.** Research Scenarios.

The functions of SLPs most frequently included in the research are assessment-diagnosis (46.06%) and therapeutic intervention (27.7%). The category ‘other’ (research focused on the design and validation of measurement instruments, professional profiles, and documentary reviews), representing 18.6% of the total, is in development and an increase can be observed between 2013 and 2018. Similarly, research in promotion (2.82%) and prevention (2.03%) appears to be in an incipient stage within the research landscape.

Regarding the areas of speech-language pathology, research on language (29.1%), hearing (27.4%), and communication (14.8%) predominate. In recent years, the number of studies in other areas such as voice (9.8%), myofunctional therapy (9.8%), and swallowing (6.11%) has increased. The areas of professional issues and speech are present in 5.95% and 3.44% of the research, respectively, being relegated to the minority. In the case of language and hearing, it was possible to observe that research has been consistent throughout the analysed period. Regarding the field of communication, there was an increase in research output between 2015 and 2019.

With regard to communication modalities, projects addressing oral communication predominate (88.2%). Other modalities are present in much lower percentages: visual-gesturing (5.17%), written (2.9%), non-verbal/non-symbolic (1.88%), and non-verbal/symbolic (1.72%). Studies on written communication can be found starting in 2014, and it is noteworthy that the research output regarding oral communication remains constant throughout the period.

**Table 4.** Functions per research scenario.

Scenario	Approach: Functions							
	Advisory	Counseling	Consulting	Assessment - Diagnosis	Therapeutic intervention	Other	Prevention	Promotion
Social Welfare	1	2	0	16	17	17	2	4
Education	7	3	0	81	52	35	2	7
Occupational	1	0	1	12	9	29	0	3
Health Care	0	2	0	185	99	38	9	4

Concerning the preferred population for research, the adult population predominates (56.7%), followed by the child population (28.52%). Research including older adults (5.79%) and adolescents (4.5%) has increased. Studies in the newborn population are present from the year 2011 (2.03%) and research in young infants (1.4%) and older infants (0.62%) starts in the year 2015.

Eighty-seven-point-nine percent (87.9%) of the population included in the studies does not present any type of disability, while 12.06% does. Within the latter, 4.7% present hearing disabilities, 3.1% intellectual disabilities, 2.1% multiple disabilities, 0.31% visual, and 0.15% mental disabilities. It should be noted that in 2019 the highest number of studies on populations with disabilities was developed (see figure 4).

On the other hand, it is remarkable that the populations included in the research present different types of disabilities. Thus, the adolescent population presents hearing disabilities, and the adult population has hearing, intellectual, or multiple disabilities. Hearing or cognitive disabilities are more frequently found in the elderly population, while the child population presents mostly intellectual, hearing, multiple, or motor disabilities. Finally, hearing impairments predominate in the newborn population.

Patients with disabilities participate mainly in studies focused on language, hearing, and communication, while subjects without disabilities participate in the areas of hearing (24%), language (23.8%), and communication (11.7%).

Depending on the relationship between the population and the setting of intervention, both the adolescent group and the adult group participate in projects focused on healthcare and education scenarios. For their part, older adults participate in healthcare studies, children in both education and healthcare, older infants in education, and young infants in healthcare.

Concerning the adolescent, adult, and older adult populations, more studies can be found in the diagnostic evaluation category. The same is observed concerning the child and older infant populations. As for young infants, there is a predominance of the area of promotion, and documentary studies are more frequent in adults and older adults.

In relation to the areas of intervention, the adolescent population participates in studies focused mainly on language, the adult population in language and hearing research, older adults and toddlers in hearing studies, older infants in communication, and younger infants in hearing studies.

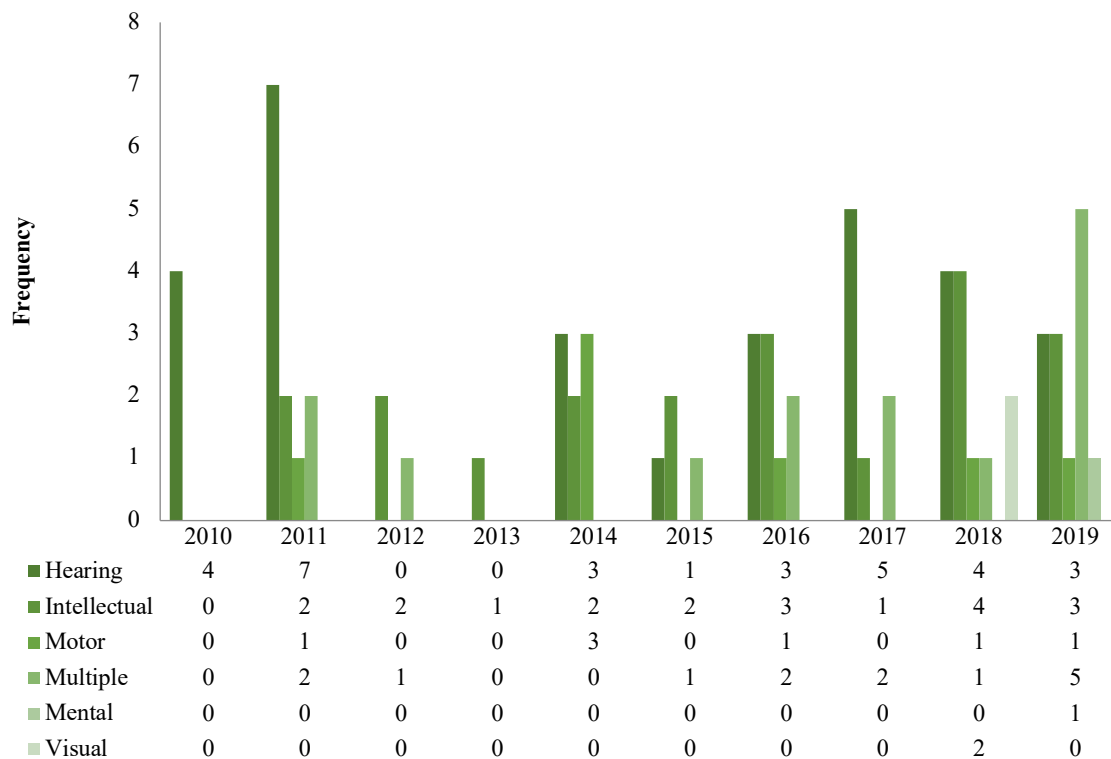


Figure 4. Research output according to the type of disability, per year.

## DISCUSSION

Research has gradually permeated various contexts of the scope of action of SLPs. The analysis of the studies in Speech-Language Pathology in our country reveals new research scenarios, besides the clinical and educational settings. Spaces such as corporations and the community have become relevant for speech therapy, along with the incorporation of social models, which have gained a place alongside rehabilitative and biological models. These have made it possible to explore, describe, and characterize new environments for Speech-Language Pathology (Solano López et al., 2009). The national research landscape in academic settings confirms that research in these lines is emerging and that there is a need for strengthening them within training programs. Moreover, it shows that the advances in speech-language pathology impulse new research contexts.

Research in Speech-Language Pathology combines approaches from both the natural sciences and the social and human sciences, achieving a scientific identity and allowing for the production of their own knowledge. Thanks to the above, conceptual definitions have been proposed, theories have been built, and explanations

have been suggested around its object of study (human communication and its disorders).

The diversity in research output between universities is due to the number of students within each training program, the region of Colombia where the program is located, and institutional policies on research development. Most of the research projects are associated with undergraduate training and only some with postgraduate training. This distribution is explained by the limited number of Speech-Language Pathology postgraduate programs in the country, and the limited number of students in each cohort. It is important to mention that the training process for SLPs at the master's and doctoral levels is difficult to describe since there are few programs specifically developed for the profession, with most of the offers at both levels being interdisciplinary.

Regarding collaboration, the results reveal an increase in the number of studies carried out with inter-institutional, national, and international cooperation. Although this has been reflected in an increase in the research output, it does not seem to be representative. For this reason, it is necessary to continue working on the design of inter-institutional proposals that allow not only supporting the research process but also generating knowledge in



cooperation with different professionals. As shown by the results, many of these studies have focused on topics specific to the profession, and few studies have on interdisciplinary issues.

The persistent interest in research in Speech-Language Pathology, oriented towards the construction of knowledge from the areas of the discipline, responds to a need to enrich its object of study (human communication and its disorders), which is why most of the research focuses on aspects of health care. Training programs and professionals recognize the interdisciplinary bases of Speech-Language Pathology, meaning that it integrates knowledge from psychology, linguistics, anatomy, and neurology, among others. In line with the above, a need is recognized to seek a proper understanding of the phenomenon of communication, its disturbances, and advances in its definition and approach. Therefore, the trend of research leans towards this object of study, before moving on to an interdisciplinary approach.

The positivist paradigm has significantly influenced the generation of knowledge in healthcare since World War II, and from this paradigm, empirical and psychometric strategies have been derived, permeating the construction of knowledge in speech-language pathology (Maury-Sintjago et al., 2018). Studies on human communication have sought to support their findings using the scientific method and applying this paradigm to their professional work (Pava-Ripoll et al., 2011) in order to give credibility to the science of human communication. This has allowed the use of traditional psychometric, epidemiological, and experimental techniques, although the most widely used techniques are observational. The results of this study confirm that research in Speech-Language Pathology is dominated by basic research, qualitative approaches, and descriptive methods.

Additionally, we detect an influence of social and cultural methods such as ethnographic, cartographic, and historical strategies, in-depth interviews, life stories, literature reviews, and observation of populations in particular conditions. More recently and much less visibly, research has been influenced by modern Latin American social approaches (Lum, 2002). The results of this study show a recent but growing trend toward interest in the design and validation of measurement instruments for specific populations, the definition of professional profiles of SLPs when working with vulnerable populations, and the generation of documentary reviews.

On the other hand, social transformations and the dissemination of the communication needs of individuals and groups have motivated the design and implementation of strategies where the

descriptive approach stands out, while explanatory studies are less frequent, as shown by Lizarazo-Camacho & Figue Ortega (2013).

Regarding the trends of the object of study, the results show two main approaches, one focused on the advancement of knowledge on human communication and another on the nature of knowledge (communication as a social phenomenon, and an axis for human development). The latter has been explored mostly through qualitative methods.

When analysing the scenarios of healthcare and education, the results also show a focus on the evaluation and diagnostic processes within the healthcare role. This trend may be because these are considered the most traditional areas of the profession and the healthcare approach is the main focus of professional training. However, research is beginning to include communities as managers and users of diverse communication processes, distancing itself from clinical scenarios.

The traditional areas of Speech-Language Pathology (hearing, language, and voice) and the adult and child populations continue to be prioritized in research. This coincides with what has been reported in previous studies (Lander & Castro-Gómez, 2000; Montes et al., 2017; Puyuelo et al., 2010). However, there is evidence of an increasing interest in newly developed areas such as swallowing and myofunctional therapy (Mendoza & Planells, 2018). Furthermore, the areas of communication and cognition have contributed to the knowledge regarding the role of communication and language in socialization, conceptual development, and school processes.

Research on populations such as younger infants or people in special settings (critical and palliative care) shows the participation of SLPs in emerging areas, as reported by Pava-Ripoll et al. (2011). For the authors, community and business are scenarios that arise amid the clinical and biological paradigms. Although speech and language pathology is defined as the study of human communication and its disorders, the population with disabilities is not identified as the main source of research. This could respond to an intention of approaching the study of human communication from the typical processes, prevention, and promotion of communicative health.

There are few publications derived from research, hence the research output is not easily traceable. In general, the output consists of articles, posters, presentations, brochures, websites, and protocols.

In foresight, it is fundamental to develop further research in topics, areas, and populations where there is a lack of evidence,

recognizing the progress that has already been made in terms of knowledge. It is necessary to strengthen research in primary healthcare since it has become relevant in the last 5 years, and is supported by the World Health Organization's international policy.

In addition, it is crucial to strengthen interdisciplinary research that allows obtaining high-quality scientific evidence, which will in turn contribute to the growth of the object of study of Speech-Language Pathology. In order to do so, it is necessary to deliver a vision of research from academic settings that adds value to these processes for professional growth.

On the other hand, it is necessary to raise awareness among professionals regarding the support that research can provide for their practice, and its contribution to the creation of policies, the prioritization of decisions in healthcare, and to the visibility of human communication (as an axis of human development). Additionally, it contributes to the knowledge about communication disorders (as a health issue present in different populations and age groups), which deserve to be prioritized due to their impact on quality of life. Furthermore, research and publications are the main sources of experience and evidence for professional practice. This implies positioning research as a regular, conscious, and dynamic practice, from the first semesters of professional training up until specialized professional practice, as proposed by Ossa et al. (2012).

Finally, this study reveals that the training programs not only seek to develop research competence in future professionals but also to generate and disseminate new knowledge for the benefit of the people and groups with whom they work. This implies, as stated by Faber et al. (2020), that training programs in health sciences should respond properly to the demands of today's society in their profiles of graduation. The current social, economic, environmental, and political transformations require higher education institutions to recognize, value, and work toward the development of investigative skills.

In this context, the results show that the training programs propose the development of courses at a micro-curricular level and the implementation of strategies (research incubators, research assistants, research projects as a degree option) at the macro-curricular level, seeking to a) connect the professionals in training to the investigative process; b) enrich the theoretical frameworks and procedures that are used in the field of human communication and its disorders, to provide feedback to the curriculum; c) support individuals and groups in overcoming communication difficulties that influence or limit their social participation, and d) unify

efforts within cooperation networks that facilitate interdisciplinary, national, international, and inter-institutional work.

In order to improve both research productivity and its dissemination, it is fundamental to develop strategies aimed at research methodology and to fine-tune the processes of monitoring and reporting the research output, especially given the scarcity of publications. This may be due to the characteristics of dissertations, which are mostly descriptive and include small samples. Furthermore, there is an evident need to promote investigative activity in professional settings, starting from the first years of training, since it is a source of evidence-based practice, which validates the profession and allows it to evolve.

At a methodological level, it is necessary to diversify the approaches used for research, given the diversity of the settings and the challenges encountered in them. Thus, epidemiological, experimental, and critical research should be promoted. In addition, when carrying out design and adaptation studies to validate an instrument for its use in the country, it is essential to include a description of the instrument, as well as to incorporate the new requirements regarding ethics and the handling of personal information. It is also important to consolidate the relationship between groups and between national and international institutions mediated by research.

On the other hand, there is a need to carry out epidemiological research, since the data has been obtained from small samples, and this does not allow for generalizations to be made. The verbal modality is the only one that is prioritized, the non-verbal modalities and the non-symbolic stage are not studied, and there are practically no studies on newborns. Research has been mostly developed in academic spaces, and this should be extended to the entire professional community, as a commitment to the field. The pandemic allowed rapid growth and transformations in the way in which research is carried out and the purpose of research in the world, which favors future processes and professional challenges for speech-language pathology, a situation that should be studied in the following years.

## **CONCLUSIONS**

Research in speech-language pathology in Colombia is characterized at a methodological level by presenting a mainly descriptive approach, with the explanatory method being less commonly used. The concern for contributing to basic knowledge



stands out, followed by applied research, highlighting the development of qualitative and, more recently, mixed approaches.

There is a variety of techniques and strategies used, although observational ones are the most frequent. Psychometric, traditional epidemiological, and experimental strategies can also be observed. In addition, research in Speech-Language Pathology has been influenced by ethnographic, cartographic, and historical strategies, in-depth interviews, life stories, literature reviews, and observation of populations under particular conditions. More recently, techniques from critical epidemiology and Latin American streams have been incorporated.

A trend towards research in populations without disabilities is identified, focused on the process of diagnostic evaluation and intervention as part of the clinical role of SLPs, especially in healthcare and education settings. The traditional areas of Speech-Language Pathology (hearing, language, and voice) continue to be privileged in research, as well as the populations of adults and children. However, there is a growing interest in areas such as swallowing, myofunctional therapy, language learning processes, and cognition. In addition, there is a focus on young infants and people in special care settings, such as critical and palliative care.

We suggest a greater emphasis on the dissemination of the research output, through publications and the socialization of advances, intending to turn them into a scientific basis for the profession. Moreover, it is important to recognize this profession as a discipline that generates knowledge to maintain ethical and evidence-based professional practices. In future research, the reality before and after the pandemic should be compared. This is relevant since pedagogy has had to undergo changes like virtualization, has become more flexible, and Speech-Language Pathology has been included in complex scenarios such as intensive care and palliative care units.

## ACKNOWLEDGMENTS

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