English

Telephonoaudiology applications in Brazil: a review study

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Abstract

Purpose: To identify and characterize telepractice in speech and language pathology actions carried out in Brazil in the main areas for Speech Therapy. Method: Systematic Review of original Brazilian articles, written in Portuguese-language, English-language and Spanish-language, indexed in BVS, Pubmed, Scopus and Web of Science. Duplicate articles were eliminated and three researchers analyzed independently title and abstract from articles that were following the criteria. In the next moment, selected articles were read to extract the following datas: author, year, type of study, location, target audience, study approach and area were collected. Results: A total of 2287 articles were found, of which only just 24 were included based on the eligibility criteria. The years with the most publications were 2013, 2017 and 2018. From 2016, publications about teaching and practicing together of telepractice in speech and language pathology had started. Most of the studies were from São Paulo and were about teaching actions in Audiology. Conclusion: Even with the increase of publications in the last few years, in view of the benefits provided by telepractice in speech and language pathology, more studies about this theme need to be carried out in different areas from Speech Therapy.

Keywords: Speech Therapy; Systematic Review; Telemedicine; Speech Pathology.

Resumen

Aplicaciones de la telefonoaudiología en Brasil: un estudio de revisión.

Objetivo: Identificar y caracterizar las acciones de Telefonoaudiología realizadas en Brasil en las principales áreas de actuación. Método: Revisión sistemática de la literatura con búsqueda de artículos originales brasileños, escritos en portugués, inglés y español, en las bases de datos BVS, PubMed, Scopus y Web of Science. Se eliminaron los artículos duplicados y tres revisores analizaron el resto leyendo los títulos y resúmenes de forma independiente. Luego, los artículos seleccionados fueron leídos en su totalidad para extraer los datos de interés: autor, año, tipo de estudio, ubicación, público objetivo, enfoque de las acciones y área. Resultados: Inicialmente se localizaron 2287 referencias, luego de la eliminación de artículos duplicados y lectura completa, 24 corresponden a los criterios de elegibilidad. Los años con mayor número de publicaciones fueron 2013, 2017 y 2018. A partir de 2016, las publicaciones pasaron a contemplar acciones concomitantes entre la enseñanza y la práctica de la Telefonoaudiología. La mayoría de los estudios se desarrollaron en el estado de São Paulo, con acciones de enseñanza en el área de Audiología. Conclusiones: Aún con el aumento de publicaciones en los últimos años, ante los beneficios que brinda esta forma de prestación de servicios, se hacen necesarios estudios sobre las aplicaciones prácticas de la Telefonoaudiología en diferentes áreas del conocimiento.

Palabras clave: Logopedia; Revisión sistemática; telemedicina; Terapia del lenguaje.

Resumo

Aplicações da telefonoaudiologia no Brasil: um estudo de revisão.

Objetivo: Identificar e caracterizar as ações em Telefonoaudiologia realizadas no Brasil nas principais áreas de atuação. Método: Revisão integrativa de literatura com busca de artigos originais brasileiros, escritos em Português, Inglês e Espanhol, nas bases de dados BVS, PubMed, Scopus e Web of Science, entre os meses de novembro e dezembro de 2020. Os artigos duplicados foram eliminados e três revisoras analisaram os restantes mediante leitura dos títulos e resumos de forma independente. Em seguida, os artigos selecionados foram lidos na íntegra para extração dos dados de interesse: autor, ano, tipo de estudo, local, público-alvo, abordagem das ações e área. Resultados: Inicialmente foram localizadas 2287 referências, após eliminação dos artigos duplicados e leitura na íntegra, 24 corresponderam aos critérios de elegibilidade. Os anos com maior número de publicações foram 2013, 2017 e 2018. A partir de 2016 iniciaram-se as publicações contemplando ações concomitantes entre ensino e prática da Telefonoaudiologia. A maioria dos estudos foram desenvolvidos no estado de São

Paulo, com ações de ensino na área de Audiologia. Conclusões: Mesmo com o aumento das publicações nos últimos anos, tendo em vista os benefícios proporcionados por esta forma de prestação de serviços, faz-se necessário estudos sobre as aplicações prática da Telefonoaudiologia nas diversas áreas do conhecimento.
Palavras chave: Fonoaudiologia; Revisão Sistemática; Telemedicina; Fonoterapia.

Introduction

The pandemic context caused by the coronavirus, SARS-Cov-2, introduced in 2020 in Brazil, changed the demands of the labor market for the performance of health professionals, both due to the increase in the demand for health care and the changes in the service caused by social distancing. Social isolation favored the transformation of the offer of health care, from the expansion of the use of care modalities that until then were secondary in the services[1].

The use of technology in general through teleservice and telemonitoring for health promotion has expanded the horizons of professional health care[2]. The process of expanding the use of technology as a means of contact was not restricted only to health care, but to other daily activities to avoid social contacts, such as work and remote teaching[3].

In 2020, the regulation of Telephonoaudiology by the Federal Council of Speech Therapy as a professional act establishes its equivalence in the services provided in person, observing the Code of Ethics[4]. Defined as the exercise of the profession mediated by information and communication technologies (ICT), Telephonoaudiology aims to promote, prevent, identify, evaluate, diagnose and intervene in health conditions within the competence of the speech-language therapist[5]. Telephonoaudiology is shown to be a tool capable of expanding and improving the accessibility of health services, which positively impacts the quality of care provided by the speech-language therapist[4, 6].

The regulation of the exercise of Telephonoaudiology occurred at a time of change and need. Since the last decade, it is possible to identify several studies involving the analysis of the application of telehealth in speech-language therapy according to the current resolutions[7]. Although the expansion of Telephonoaudiology is recent, its use in teaching and/or in speech-language therapy practice has moved the scientific community over the last few years.

The potential of online digital resources as a tool for teaching, training, and speech-language therapy intervention with expanded skills and consistent with the current job market, resulted in the expansion of the use of Telephonoaudiology[1, 8, 9].

Considering the topicality of the theme and the few existing studies on telehealth in speech-language therapy, it is important to investigate in the literature the actions in Telephonoaudiology carried out in Brazil. Understanding the process of digital transformation, its structuring and development, and the actions in the different areas of speech-language therapy is fundamental for the training of the speech-language therapist, expanding the development of skills necessary for the current job market.

With the general objective of identifying and characterizing Telephonoaudiology actions in the main areas of activity (language, audiology, orofacial motricity, voice, and collective health) this study hopes to contribute to the understanding of the use of technology in the training and performance of the speech-language therapist in Brazil.

Method

This study is a systematic literature review, organized according to the recommendations of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The search for articles was carried out between November and December 2020 in the following databases: VHL, PubMed, Scopus, and Web of Science that met the following inclusion criteria: being an original Brazilian research article, having the Telephonoaudiology as a theme, written in Portuguese, English or Spanish. The period covered by the included studies was between 2009 and 2020. Articles that addressed Telephonoaudiology in other countries were excluded from the study.

The bibliographic search strategy was constructed by combining descriptors or keywords joined by Boolean indicators "OR" or "AND". The following Portuguese keywords indexed in the Health Sciences Descriptors were combined: Speech, Language and Hearing Sciences, Telemedicine, Remote Consultation, Telemonitoring, Education, Distance, and Brazil The selected articles were analyzed and their main contributions were systematized.

After completing the search in the databases, duplicate articles were excluded. Articles were independently reviewed by three calibrated reviewers. For the selection of studies, initially, the reading and

classification of titles and abstracts were carried out, respecting the eligibility criteria. Then, the selected works were read in full for the final selection of articles and extraction of data of interest.

The information extracted from the selected publications were: author, year, type of study, location, target audience, approach to actions, and area. A standardized Excel® spreadsheet was used to assist in the extraction. Three trained researchers acted in the data extraction independently, possible disagreements were discussed with the group of researchers to reach a consensus.

Results

Based on the search strategy, a total of 2.282 articles were initially identified (620 in the VHL, 653 in Pubmed, 574 in Scopus, and 435 in the Web of Science). Subsequently, we removed duplicate articles, the remaining 1.562 articles for the title and abstract reading. After reading the title and abstract and excluding articles that did not meet the inclusion criteria, 62 articles remained for a full reading. Of the articles read in full, 24 met the eligibility criteria as shown in Figure 1.

Figure 1. Prism Flowchart

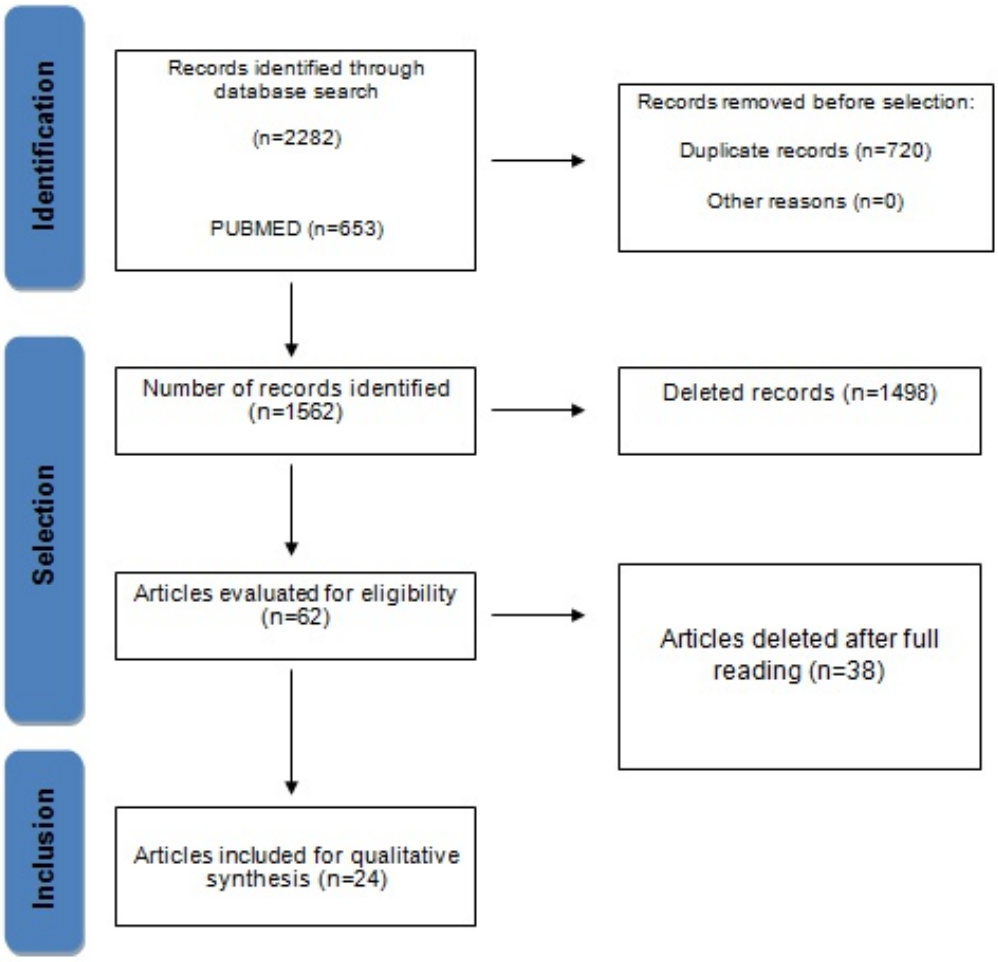


Table 1 shows the selected studies. Regarding the type of study, 19 (79.2%) were observational, 2 (8.3%) were documentary research and 3 (12.5%) were experimental. Six (25.0%) of the 24 selected articles addressed the practice of telephonoaudiology, 2 (8.3%) the teaching and practice, and 16 (66.7%) dealt with teaching through information and communication technologies of telephonoaudiology.

Audiology was the most recurrent area of Speech-language Therapy, being mentioned in 50.0% of the articles, while 37.5% (9) of the articles dealt with General Speech-language Therapy without focusing on a specific area of Speech-language Therapy. In 12.5% (3) of the articles, the focus was on orofacial motricity.

Most studies were developed in the state of São Paulo, with a total of 14 (58.2%) studies exclusively in this state. Another 4 (16.8%) studies were developed in São Paulo in partnership with other states, such as Espírito Santo, Distrito Federal, Rio de Janeiro, and Santa Catarina. Furthermore, 2 (8.3%) studies were carried out in Minas Gerais and another 2 (8.3%) in

Table 1: Description of publications separated by authors, year, type of study, location, target audience, approach, and area of Speech-Language Pathology and Audiology.

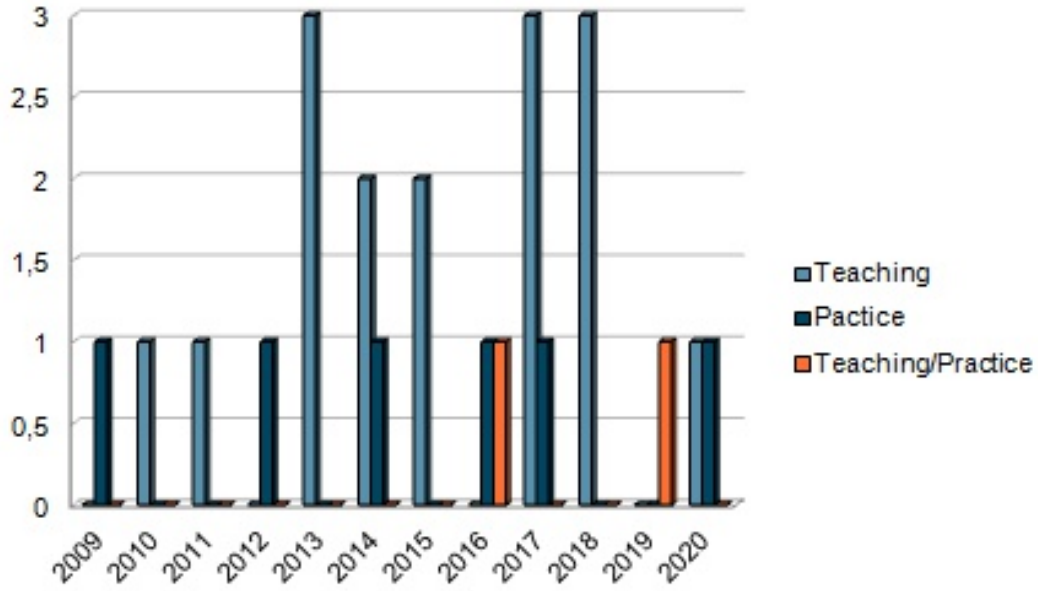
Author	Year	Type of Study	Place	Target Audience	Aproach	Area
Zumpano, CE et al.	2009	Observational	São Paulo and Distrito Federal	Patients and professionals	Practice	Audiology
Blasca, WQ et al.	2010	Observational	São Paulo	Participants	Teaching	Audiology
da Silva, ASC et al.	2011	Observational	São Paulo	Patients and professionals	Teaching	General speech-language therapy
Campos, PD et al.	2012	Experimental	São Paulo	Patients	Practice	Audiology
Spinardi-Panes, AC et al.	2013	Documentary Research	São Paulo	Professionals	Teaching	General speech-language therapy
Corrêa, CC et al.	2013	Observational	São Paulo	Participants and professionals	Teaching	Orofacial Motricity
Araújo, ES et al.	2013	Experimental	São Paulo and Santa Catarina	Professionals	Teaching	Audiology
Corrêa, CC et al.	2014	Observational	São Paulo	Participants	Teaching	Audiology
Marcolino, MS et al.	2014	Observational	Minas Gerais	Professionals	Practice	General speech-language therapy
Pulga, MJ et al.	2014	Observational	São Paulo	Participants	Teaching	General speech-language therapy
Blasca, WQ et al.	2015	Observational	São Paulo	Participants	Teaching	Audiology and Voice
Chaves, JN et al.	2015	Observational	São Paulo	Professionals	Teaching	Audiology
Brito, TDLV et al.	2016	Observational	São Paulo and Espírito Santo	Professionals	Teaching/ Practice	General speech-language therapy and Audiology
Lucena, AM et al.	2016	Observational	Minas Gerais	Professionals	Practice	General speech-language therapy
Mourão, NAL et al.	2017	Documentary Research	Pará and Distrito Federal	Professionals	Teaching	General speech-language therapy
Nascimento, CMB et al	2017	Observational	Pernambuco	Professionals	Teaching	General speech-language therapy
Favoretto, NC et al	2017	Observational	São Paulo	Participants and professionals	Teaching	Gerontologia
Maximino, LP et al	2018	Observational	São Paulo	Professionals	Assistance/Practice	Audiology and Voice Audiology
Penteado, BE et al	2018	Observational	São Paulo	Professionals	Teaching	Audiology
Silva et al	2018	Experimental	São Paulo	Professionals	Teaching	Public Health
Oliveira et al	2018	Observational	São Paulo	Participants	Teaching	Voice
Brito et al	2019	Observational	São Paulo and Rio de Janeiro	Participants	Ensino/Practice	General speech-language therapy and Public Health
Dimer et al	2020	Observational	Rio Grande do Sul	Patients	Assistance/Practice	Dysphagia and Language
Silva et al	2020	Observational	Pernambuco	Professionals	Teaching	Public Health

Pernambuco. One (4.2%) study was also carried out in the state of Rio Grande do Sul and another in a partnership between the state of Pará and Distrito Federal (4.2%).

Regarding the target audience, the studies were divided into the following categories: patients; participants; professionals; participants, and professionals; patients and professionals. The category of patients was addressed in 2 (8.3%) studies, and in one of them, the target audience was individuals with hearing loss between 39 and 88 years old. The second study approached patients at home, with no described age group. The category of participants was found in 6 (25.0%) studies, with the target audience of speech therapy students, adolescents between 13 to 15 years old, primary and secondary school students, coordinators of the SIGs (Information System in Management Social- Sistema de Informação em Gestão Social) in the Telemedicine University Network (RUTE- Rede Universitária de Telemedicina). The category of professionals was present in 12 (50.0%) studies, consisting of speech-language therapists; community health workers; nurses and doctors; health professionals in general; computer science professionals; social work, arts education, graphic design, media, and journalism. For the category of participants and professionals, 3 (12.5%) studies were classified that included undergraduate and graduate students of speech-language therapy and dentistry courses and professors of the respective courses; parents and guardians of babies; elderly and elderly caregivers. Finally, the category of patients and professionals consisted of 1 (4.2%) study that had cochlear implant users and speech therapists as its target audience.

We observed (Graph 1) that 2013, 2017, and 2018 were the years with the highest number of publications and from 2016 onwards, publications began with concomitant approaches between teaching and practice of Telephonoaudiology. In 2017 and 2018, the publications were more focused on teaching. In 2019 teaching and practice concomitantly. The sample studies carried out between 2019 and 2020, varied approaches between the three categories: teaching/practice, teaching, and practice.

Graph 1: Number of studies in the year of publication and the type of approach in Telephonoaudiology



Discussion

Regarding Telehealth in Speech-Language Pathology and Audiology in Brazil, it is possible to observe that there is limited literature, containing few studies on the actions carried out, mediated by Information and Communication Technologies (ICTs) in the country. This corroborates that most of the articles approach speech-language therapy in general, without restricting the focus of the study to one of the areas of speech-language therapy.

The term Telephonoaudiology came to regulate and categorize telehealth activities related to Speech -LanguageTherapy, since the term Telehealth gained prominence due to its comprehensive character and the more advanced development of actions in other areas of health. The decision to adopt a more specific term originated from the intention to better delimit the scope of studies related to speech-language therapy, and it remains necessary to expand the specific

scientific production directly related to the topic[5].

It is important to point out that most of the selected articles address teaching, which corroborates the fact that Telephonoaudiology started its actions in partnership between academic centers and health units, with the support of research funding agencies[10,11]. An example of these actions was the Telemedicine University Network (RUTE-Rede Universitária de Telemedicina), a program created in 2006, to integrate teaching, telemedicine, and public health, between a public university and teaching hospitals, and having formally created the units of telemedicine. The practice of Telephonoaudiology has recently grown, a fact that has made it difficult to build studies in this aspect of service provision[5].

Audiology was the most recurrent area of Speech-Language Pathology and Audiology, in 50% of the articles, in line with the finding of another study, which observed audiology as the predominant specialty, corresponding to half of the publications[12]. This finding can be explained by the actions taken early in this area, such as the creation of the Department of Teleaudiology in 2004, at the XIX International Audiology Meeting, in which the offer of distance audiology courses, preparation of educational materials for students, patients, and health professionals[13].

Most of the studies were developed in São Paulo and, from this data, it is possible to perceive the importance of this state in the development of Telephonoaudiology. São Paulo stands out and is a pioneer in the development of actions focused on this theme. As an example, there are the activities started in 2003, in which professors from the Department of Speech-Language Therapy, Faculty of Dentistry of Bauru, Universidade de São Paulo (FOB/USP), began feasibility tests for the provision of speech-language therapy services at a distance, as well as the construction of instructional and client counseling materials[5].

Only two studies were carried out with patients, which shows the scarcity of literature regarding the reality that professionals face most in their routine of care. It is necessary to invest in studies that address this issue and can evaluate Telephonoaudiology, as a clinical strategy for its best use. The recent regulation and expansion of the Telephonoaudiology practice will allow the beginning of the execution of new studies and the expansion of the literature on the subject[14].

Regarding the category of participants, most studies had the participation of students, a very important audience to be evaluated in teaching and education actions. Also, previous studies have shown that the use of remote tools is effective in improving and training speech-language pathology students[15].

In the category of professionals and the category of participants and professionals, most participants are health professionals, which shows that Telephonoaudiology can be a great tool to be used in actions to instruct, train, and dialogue with other health professionals. During the beginning of the practice and throughout the growth of telehealth and telephonoaudiology, teleconsulting actions and case discussions among professionals gained strength and emerged the use of Telephonoaudiology at the national level[5]. Also, more recent studies indicate that these discussions between health professionals continue, with the greatest demand for teleconsultations coming from speech-language therapists but they are followed by nurses and doctors[16].

Regarding the distribution of study approaches by age, we could see that studies involving teaching are more frequent in most years and that the growth of joint approaches (teaching/practices) has only emerged in recent years. This was because of the academic environment in which the studies are developed, in which there is a strong connection between teaching and practice5.

In 2013, one of the years with the largest publications, the predominant approach was teaching. This can be justified by CFFa Resolution 427, which came into force this year, and, despite having expanded the scope of activities that could be carried out through ICTs, it was still quite restricted, making it impossible to expand practical activities, as it vetoed clinical evaluation, prescription diagnosis or therapy at a distance without the presence of another speech-language therapist mediating with the client[5]. Therefore, with the current regulation published in 2020, a greater number of publications with an approach to the speech-language pathology care practice is expected in the coming years.

As limitations, we identified heterogeneities of the studies in their approach and there were no descriptions regarding the modality used regarding ICTs, making it impossible to discuss the strategies used to handle information and assist in communication.

The description of the use of Telephonoaudiology

carried out in this study is extremely important to understand the transformation that this intervention has caused in the professional practice of speech-language therapy, to its structuring, the focus of actions, and application in each area. Therefore, based on the analysis presented, professionals will be more integrated into the reality of Telephonoaudiology and will be able to use such information to adhere to this practice or promote studies for the continuity of scientific advances in the theme.

Conclusion

Most national studies on Telephonoaudiology actions are observational and developed in the state of São Paulo. Also, the studies mainly address teaching through information and communication technologies, which highlights the need to carry out more actions with practical interventions in patients. The area with the largest number of publications is audiology, showing that studies are also needed to demonstrate the performance of Telephonoaudiology in other areas of the profession to create strategies for the best use of Telephonoaudiology.

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