



Speech-Language Pathology and Audiology and Gerontology: a systematic review of SLPA's clinical intervention

Fonoaudiologia e Gerontologia: revisão sistemática da atuação Fonoaudiológica

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*Rafael Gomes Oliveira dos Santos**

*Antonio Lucas Ferreira Feitosa**

*Andresa Mayra da Silva Melo**

*Marisa Siqueira Brandão Canuto**

Abstract

The oldest population has attracted a growing interest in all science and Speech-Language Pathology and Audiology areas, following its way and has been gathering strength in the Gerontology field. The objective is to establish a search about the speech therapy for the elderly. It was made a study by literary references through the last ten years in databases: Lilacs and SciELO. This study aims to observe the Speech-Language Pathology and Audiology diversity researches that study the life quality in senescence and active aging. The literature describes Speech-Language Pathology and Audiology contributing to the progress and redefining behaviors, which aim to favor the aging process.

Keywords: Aging; Elderly; Audiology; Voice; Language; Orofacial Movement

* Universidade Estadual de Ciências da Saúde de Alagoas – UNCISAL, Maceió, Alagoas, Brazil.

Authors' contributions:

RGOS Design of the study; Methodology

ALFF Data collection

AMSM Stub article

MSBC Critical review; Guidance

Correspondence address: Andresa Mayra da Silva Melo andresamayramelo@gmail.com

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Resumo

O envelhecimento populacional vem despertando o interesse crescente em todas as áreas da Ciência e a Fonoaudiologia, seguindo esse percurso, vem se aprofundando na área da Gerontologia. Objetiva-se estabelecer uma busca quanto à atuação fonoaudiológica junto ao idoso. Foi realizado estudo retrospectivo, por meio de referências literárias dos últimos dez anos nas bases de dados: *Scielo* e *Lilacs*. Este estudo procura constatar a diversidade das pesquisas fonoaudiológicas que estudam a qualidade de vida na senescência e o envelhecimento ativo. A literatura descreve a Fonoaudiologia contribuindo para os avanços e redefinindo condutas, os quais visam favorecer o processo de envelhecimento.

Palavras-chave: Envelhecimento; Idoso; Audiologia; Voz; Linguagem; Motricidade Orofacial

Resumen

El envejecimiento poblacional viene despertando el interés creciente en todas las áreas de la Ciencia y la Fonoaudiología siguiendo ese recorrido, viene profundizando en el área de la Gerontología. Se pretende establecer una búsqueda en cuanto a la actuación fonoaudiológica junto al anciano. Se realizó un estudio retrospectivo, a través de referencias literarias de los últimos diez años en las bases de datos: Scielo y Lilacs. Este estudio busca constatar la diversidad de las investigaciones fonoaudiológicas que estudian la calidad de vida en la senescencia y el envejecimiento activo. La literatura describe la Fonoaudiología contribuyendo a los avances y redefiniendo conductas, los cuales apuntan a favorecer el proceso de envejecimiento.

Palabras claves: Envejecimiento; personas de edad avanzada; audiología; la voz; idioma; Motricidad Orofacial

Introducion

In Brazil, 60-year-old people are considered elderly. This age is also used as a classifier by the World Health Organization (WHO). The Brazilian Institute of Geography and Statistics (IBGE) fits Brazil among the countries with the biggest number of elderly people – 24,8 million people in 2012 over 60, with an increase of 18% in 2017, coming to 30.2 million. In 2017, the Brazilian life expectancy was of 75.8 years according to IBGE. Equally to what happened initially in developed countries, population aging is a fact in the so-called emergent countries. Currently, approximately 60% of elderly people live in developing countries, Brazil being among them.

The process of population aging and longevity have caught increasing attention in all areas of knowledge, because of man having gotten around expanding the limits of their life span, creating new social, political and economical demands. Thus, Gerontology is an area in ascendency because of the aging of the Brazilian population.

Aging is defined as a manifestation of events of biological nature that occur over human life in

period of senescence. This phase, as well as all others in the vital cycle, is marked by a series of modifications, morphological and functional alterations that echo throughout the organism over time.

In the human being, this progressive phenomenon, besides catalyzing the organic expense, provokes alterations in the cultural, social and emotional aspects. Concomitantly, the physiological process of aging, other alterations appear as a result of chronic illnesses, commonly manifested in people over 60 years, characterizing senility.

Speech, Language Pathology and Audiology has observed this practical possibility and started studies in the field in the mid 1990's. In an attempt of stating if there was diversity in the researches that could favor the comprehension of the manifestations of the aging process, it was optioned to establish a research of the Speech, Language Pathology and Audiology action along with the senescent. It is believed that Speech, Language Pathology and Audiology as a medical profession, constituent of programs and inter disciplinary teams, have accompanied the growth and development of assistance services in the promotion and rehabilitation of the Elderly.

A redirectioning of the researches has been noticed in favor of the quality of life of the elderly and not only an attention towards the pathologies that can commit them. This way, the objective of the revision was to establish an action of the Speech, Language Pathology and Audiology community in favor of the elderly population in order to determine the approached factors and depict the advances in the great areas of this professional area.

Method

A retrospective study was performed in the review of the literature, with an integrated systematic approach; for the search of bibliographical information, the following electronic database platforms were used: Scientific Electronic Library Online (SciELO) and Latin American and Caribbean Literature in Health Science (LILACS), with a cut of the last 12 years (2004-2016). For this matter, the descriptors “elder”, “aging”, “audiology”, “voice”, “language”, “orofacial motricity” were used correlated. Only the articles of the established cut period were considered with all thesis and monographs being excluded, as well as duplicated articles. The articles were classified according to one of the four main areas of Speech, Language Pathology and Audiology: Voice, Orofacial Motricity, Audiology and Language.

The articles that didn't correspond to the field of Speech, Language Pathology and Audiology were removed from the research. All articles were

evaluated and read in search of research lines according to each area of Speech, Language Pathology and Audiology. The results, of the number of articles, selection and research lines, were organized in a concise way in spreadsheets for better evaluation and further discussion.

Results

The contributions of the selected descriptors for this review presented a discrepancy when researched in distinct databases. The LILACS database showed a higher average of Speech, Language Pathology and Audiology scientific studies in the areas of Language and Voice when crossed with the Elder and Voice descriptors (n=109), Aging and Language (n=275) and Elder and Language (n=135), in counterpoint to the Orofacial Motricity in which the literature appeared to be scarce.

In the SciELO database, the combinations that also appeared in higher quantity are related to the areas of Orofacial Motricity and Language, when crossed with the Elder and Language descriptors (n=18), Aging and Orofacial Motricity (n=23), and Elder and Orofacial Motricity (n=32). Among all areas of Speech, Language Pathology and Audiology action, Audiology was the one who demonstrated the smallest number of scientific articles. The flowchart (Figure) schematizes the article selection process, as well as the quantity that was selected to compose the review.

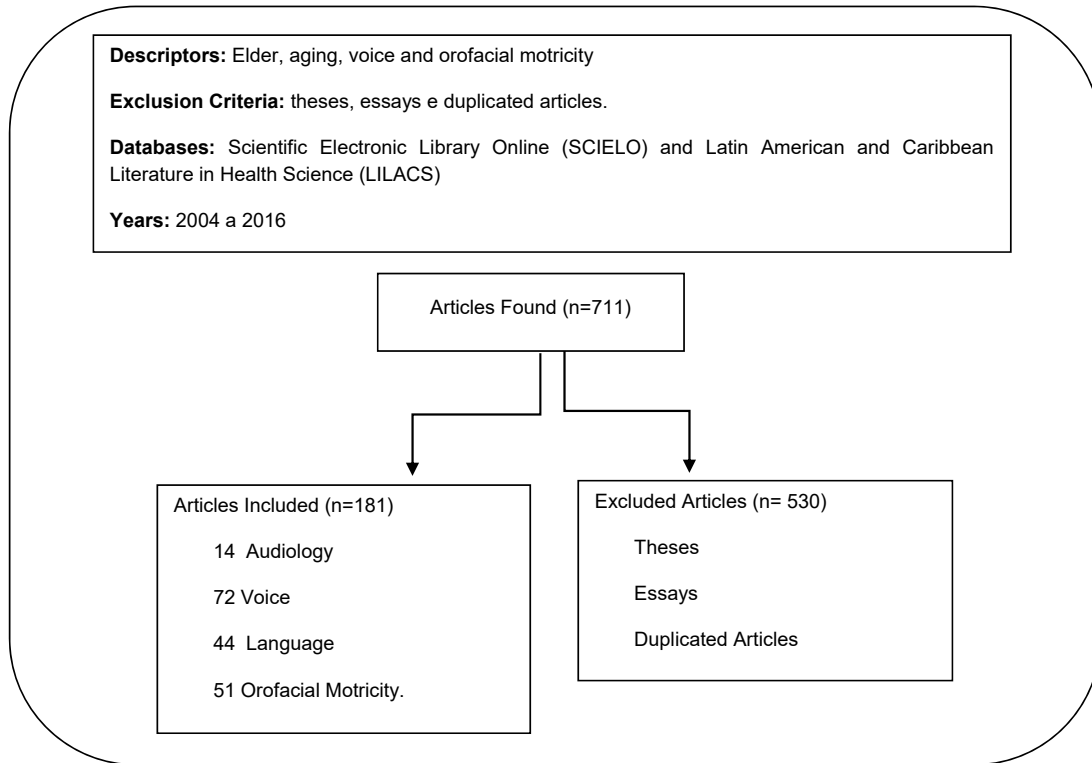


Figure 1. Research strategy for selection of articles

According to the criteria of exclusion determined to delineate the research, from the 711 studies found in the databases, only 181 were considered for reading and analysis. The spreadsheet presents the lines of research corresponding to the four areas of Speech, Language Pathology and Audiology over the last 12 years (2004-2016).

In the analysis of the articles referring to Audiology, clinic and scientific productions can be observed evaluating the aging process in the structures that compose the auditory system. In the Voice area, literature depicted different theory chains and research lines for the degenerative process of aging in the organism, thus highlighting the aging of the voice and/or presbyphonia as a normal consequence of senescence, as well as the study of acoustic, clinic, quality and quantity analysis of the vocal aspects of the elder, also approaching,

in counterpoint, the effect of vocal habits and their impact in the elder's voice.

In the language area, investigations were marked over the pathologies of language and speech of senescent individuals committed by neurological alterations, the aspects of expressive language (communication) of the healthy elder in a functional way, the effect of the aging process over literacy, reading and writing of the elderly. The research lines of the 51 articles in the Orofacial Motricity area investigated and described the myofunctional and swallowing disturbances in the senescent individual, correlating these speech, language pathology and audiology manifestations in the organic process of aging in the organism and, above all, in the Speech Language Pathology and Audiology intervention when facing these manifestations.

**Spreadsheet 1.** Quotes of research lines found in the areas of Audiology, Voice, Language and Orofacial Motricity in the articles selected (2004-2016)

Areas of Acting	Research Lines
	Auditory Processing Hearing Loss Presbycusis PSAP *
Audiology	BAEP ** Thresholds and Audiometric curves Otological Complaints Auditory sensibility Vestibulopathy Occupacional Noise
	Voice Perception Presbyphonia Presbylarynx Vocal Extension Acoustic Analysis Vocal Habits QLV***
Voice	Vocal Complaints Vocal Analysis Neurological dysphonia Dysarthria Dysphonia Maximum Phonation Time Vocal Alteration
	Language difficulty Speech Cognitive Decline Functional Ability of Language Literacy Intellectual Skill
Language	Speech Pause Communication Aphasia Writing Lexical Access Expression and Interpretation/Comprehension Verbal
	Presbyphagia Dysphagia Facial Aging Dental Prosthesis Adaptation Oral Health Respiratory Dynamic Feeding Dynamic Healthy Deglutition Deglutition e Revascularization Functional Capability Myofunctional Disturbance
Orofacial Motricity	
Total	

* PSAP - Personal Sound Amplification Product

* BAEP - Brainstem Auditory Evoked Potential

* QLV - Quality of Life in Voice



Discussion

Initiating the line of analysis of this study with Audiology, we have knowledge of the chronological and ascendant studies. Beginning with anatomy and physiology of the hearing, interpreting the auditory skills by means of studies about the auditory processing and senescence, investigating the social impact of hearing loss of the elder, describing the usage of PSAP, in which concerns the satisfaction of the users and the practical applicability of its usage; as well as the perception of approaching hearing loss in the basic health attention.

In the reading of articles in the audiology area, clinic and scientific productions were found concerning the aging process of the auditory system. The study about the degeneration of the auditory canals characterized the reduction of auditory acuity as a resultant of the aging of the auditory system. This relation is directly linked to the hearing loss as a third chronic condition in the elderly population and determines the level of impact that the hearing deficiency possesses in the active life of the senescent population.

The hearing loss in the elderly (presbycusis), implies a considerable decrease in the levels of information and comprehension processing of this population. Other researches collaborate to these findings by demonstrating that the increasing of the elderly population, accompanies directly with the increase of presbycusis, which interferes in the communication aspect.¹⁰ Some sensations of the individuals concerning the hearing deficit can be observed: Feeling of strangeness (hearing but not comprehending), angst and anxiety (facing the difficulty of comprehension of what is said). Some individuals stated that the hearing difficulty, however, doesn't affect them in this way, remaining able to carry a conversation, directioning transmission/reception from the verbal message.¹¹

It is possible to structure in the studies the search of the individual for solutions and these involve the use of some strategies: the search of the cure through religion, self medication and the search for specific professional attention.

Most studies between 2012 and 2014 follow the angle of the efficiency of the protection of the PSAP in the elder, the gains and implications of its usage, trying to define the degree of satisfaction in the elderly users of the auditory prosthesis in their everyday life. The satisfaction of the elder in

relation to the use of the prosthesis was quite negative, because of the fact that the prosthesis offers a high stimulus of acoustic information, however not allowing the interpretation of this information in a neural level. This can only be achieved via Speech, Language Pathology and Audiology therapy and training for the usage of an auditory prosthesis.^{12,13}

It begins highlighting the importance of the auditory prosthesis for the rehabilitation of the communication efficiency of the senescent individuals, stressing its benefits, advantages and gains. Describing an increase in the awareness of the importance of rehabilitation and auditory re-education among the health professionals in charge of assisting the elderly. However, few actions were developed for the creation of diagnostic programs, auditory triage and plans for the acquisition of personal sound amplification products (PSAP).

In the same period, another line of research highlights the need of approaching the matter of hearing loss in the elderly inserted as a wider component, initiating in the basic attention, in terms of social and health politics. It is stated here the modification of the action focus to the promotion of health and not only rehabilitation.

The analysis of texts about vocal aspects of the elderly shows us studies with the same line of research, including the objective items and conclusions; no new researches with evidence of relevant and innovative facts about the elderly vocal aspects could be observed in the last 10 years. There is a persistence of theme already discussed and analyzed.

Amidst the aging process of the organism, the voice tends to be characterized as a part of the individual that grows old along with him, accompanying the normal organic degenerative process of each structure that composes the vocal apparatus.¹⁴ The natural manifestations of this organic process, denominated presbyphonia, are characterized by lack of strength, decrease of speed, instability and articular imprecision.¹⁵ Modern authors stated that there was an exaggerated amount of studies debating questions of physiological nature delimited in the process of aging in the structures responsible for speech.

Thus, it was verified in the review of these studies that very few had been produced with the ends of comprehending the impact of the vocal conditions in the quality of life of the elder as a social individual and transmitter/receptor of speech.

Another angle of the research has developed themes related to vocal alterations in Parkinson's Disease, centering their studies in the communication aspects of this pathology and determining that the resulting manifestations of the alteration of communication are conditions determined by the characteristics of the pathology itself (stiffness and bradykinesia).

Through the Speech, Language Pathology and Audiology optics these characteristics are responsible for hoarseness, evident reduction of intensity, articular imprecision and reduced tonal gamma, commonly found in a diversity of clinical essays.¹⁶ The vocal alterations can be justified by the incomplete glottal closing, reduction of synergy and activation of the laryngeal musculature, atrophy or muscular fatigue, tension asymmetry or movement of vocal chords, stiffness of vocal chords and/or breathing muscles. Another aspect observed also refers to the difficulties found in the vocal rehabilitation of this population. What can be identified in the literature are the determining factors of the success of therapy in the communication of these patients are: the effort/interest of patients in the vocal rehabilitation process; family participation and active social life.¹⁷

A study¹⁸ analyzed the vocal acoustic, proposing to estimate the fundamental frequency (f_0) in the elderly and its perceptive-auditory correlations, resulting in an increase of the fundamental frequency (f_0) in the male gender and maintenance or reduction of fundamental frequency (f_0) in the female gender.¹⁹ What characterizes the difficulty of identification of the gender of the speaker in old subjects, because the fundamental frequency of the elderly population becomes similar.²⁰ From 2011 to 2017, the studies concern about the process of vocal aging, the structures that compose the vocal apparatus, impact of the voice over the quality of life and there is an important highlighting of the vocal pathologies of neurological nature, demarcating mainly the voice of the patient with Parkinson's demonstrating implications on the communication of this population in the social environment and depicting the Speech, Language Pathology and Audiology therapy.

In the area of Language, the 40 articles of the 12 years of scientific production on Gerontology were marked by investigations over the pathologies of language and speech of senescent individuals committed by alterations of neurological base. The

production period of 2004-2005 was marked by clinical analysis related to elderly language after ischemic cerebral vascular accident (CVA).

In 2004 a clinical evaluation was described that encompassed all aspects of language in elderly people hospitalized after CVA.²² In 2005, starts the evaluation of semantic memory, integrating the abilities of naming and lexical access of elders with Alzheimer.²³ It has been noted that, in Alzheimer, the semantic aspect of language is altered progressively. The scientific investigations suggest that the explaining of this phenomenon is owed to the difficulty that elders have concerning executive deficits, or even so the difficulty of visual recognition that affect the processing of the semantic aspect of the language. At the time, there was a small amount of studies in the national literature that evaluated and related the semantic memory and naming through visual stimulus. It was noted that through these studies that the elder committed by Alzheimer presents explicit deficit in the tasks of naming and lexical access, skills that are directly related to semantic memory.

In the year of 2006, the chain of investigational study of senescent language presented a change in scientific direction. The investigations turned to evaluate the aspects of expressive language (communication) in the healthy elder in a functional manner. The main aspects of the aging process can be described as physical, social, cognitive and behavioral alterations.²⁴ These alterations end up defining aspects of autonomy and interdependency of this individual through the characterization of their full exercise of the social experience. Knowing the disposition of language in the aging process can awaken the adaptation in the senescent population, so that they are able to accomplish their part in communication. The results found describe in a trustworthy way the functional profile of communication in healthy elders, demonstrating that the individuals are able to compensate the communicational inabilities in everyday life, noting that the communicational profile most affected was the one of lower educational level; for the reason that this population can't establish strategies to maneuver around the language alterations caused by the aging process.

In the following period of 2007-2012, the studies in Language turned to discussions over the effect of the aging process over literacy, reading and writing of the elderly. The reading and writ-

ing performances of the senescent were analyzed, through the analysis of the role of a group of elders in the development of activities related to writing in a language workshop, proposed before the beginning of the research.²⁵ It is understood that in order to the Elder to reach a satisfactory level of life during the aging process, it is necessary to search for strategies to deal with the singular questions of each subject. It is determined the effective and positive contribution of the creation of dynamics in the elder group, in terms of stimulus and reinforcements that influence in the best performance of these individuals when facing literacy.

The studies undertaken in the intervals from 2013 to 2014 retook the analysis of functional communication observed in 2006, although deepening in the subjectivity of language and social constitution of the elder. Another developed study aimed to analyze and describe the language of elders residing in a Long Term Residency for Elders (LTRE), focusing on the particularities of the language production of these elders, also relating the marks of subjectivity in the speech of each individual in a distant way, respecting their totality as a social individual and language being.^{26,27} The findings of these studies proportioned a better understanding that a LTRE must provide basic care as shelter, feeding and hygiene, and promote social spaces, with moments of constant interaction between individuals. This angle has good acceptance within the elder community, under the optics of the possibility of interaction and new forms of expressions of their “way” of language.

Through this perspective, we can conclude that each individual is a language being, that develops itself and is a result of the social relations of its environment. The established dialogue with the elderly can contribute to the understanding of language during the life period, the same way that it will also work to reveal marks of subjectivity related to the past and the present, knowing the expectations about the future and going further enough to discuss the way these elders face the matter of dwelling.²⁸ The studies about language in the senescence is composed by a series of modifications in the processing of information, making harder for the memory rescue to happen. There was the analysis of the impact of normal and pathological aging with the description of reduction of brain synapses that result in the lowering of cognitive processing, establishing connections concerning

the functional and adapted communications of the elderly population.²⁹

The lines of research of the 51 articles in the Orofacial Motricity area investigated and described the myofunctional and swallowing disturbances in the senescent individual, relating these speech-language manifestations in the organic aging process and, above all, of the Speech, Language Pathology and Audiology intervention facing these manifestations. Correlating the research descriptors, the only publication found was from 2006-2007, which described the intervention of the speech-language therapist in the LTREs that are the home of elders, defining the profile of the professional on the field. It can be noted that most part of the interviewed professionals attended specialized courses/post graduations in the oral motricity area or Gerontology. The biggest Speech, Language Pathology and Audiology complaint found in the institutionalized elders relates most part to the swallowing process. In the period of 2008, the researches were directioned to the self-perception of oral health in elders after the installation of dental prosthesis. Measurements were taken of the morphofunctional conditions of the stomatognathic system after the installation of the dental prosthesis. The authors concluded that the conditions of the stomatognathic system were not positive with the installation of the new prosthesis, none of the elders in the scientific research could adequately accomplish the three classic functions of the stomatognathic system: Mastication, Swallowing and Speech after the adaption to the new prosthesis.³⁰ The study determines the need of action of the speech-language therapist along with the odontologist for the process of adaptation of the elder to their dental prosthesis, functionally and satisfactory to the senescent, favoring the adequation of oral musculature and stomatognathic functions. It was verified that the self-perception of the elder to their oral health is disagreeable from what was found in their Speech, Language Pathology and Audiology evaluation.

In 2009 begins the study of muscular alterations in the oral functions with the objective of determining the mastication time of the food, analyzing the association of some variables related to age, the time of edentulism, maximum oral opening degree and the vertical dimension of the lower third of the face. Mastication is referred to the process in which the fully toothless elder (edentulous) per-

forms the crushing of the food, preparing the food bolus, which is adapted to the anatomical conditions it possesses. These individuals had the ability of keeping their feeding even with the anatomical alterations (bone and muscle), finding personal adaptations, however at the same time common to the edentulous senescent community. The common complaint of all, was due to the bigger time it took to prepare the food bolus.³¹ It was noticed that at the time it was discussed about Mastication, but there were few studies that approached about the mastication time, and even less arguments and investigations developed over time about mastication time on total edentulous elders.

Similarly to what was produced in the 2006-2008 period, there was an emergence of researches describing muscular alterations in the elders in the years of 2009 and 2010; however, it was in 2010 that it was depicted the repercussion of these in the swallowing of the institutionalized elders. It was verified the myofunctional correlation with the alimentary dynamic of the female elders, relating clinical aspects of swallowing as well as of ambient, cognitive and behavioral linked to feeding. The literary review states that in LTREs are common the food complaints that increase the monitoring of specialized care with these elders. The same are committed by several comorbidities, among them Aspiration Pneumonia, configuring one of the main causes of morbimortality in the phase of senescence; frequently associated to constant and long term hospitalization, making the assistance more prolonged and more expensive for the institution.³²

It is understood the importance of the swallowing management of the institutionalized senescent population, facing the series of myofunctional manifestations that can occasion organic complications. Still in 2010, modern theorists centralized their clinical essays in a way to understand the existing relation between the swallowing disturbances and the coronary disease among elders with an indication of heart surgery. It was evaluated the deglutition of heart disease senescent patients indicated to the coronary bypass graft surgery, identifying the characteristics of deglutition of these individuals.³³ During the literature review, it was found that oropharyngeal dysphagia commits elders after heart surgeries, what provides an increase in the risk of aspiration, followed by respiratory complications and pneumonia. The heart disease senescent patients present alterations in coordination between

the functions of breathing and deglutition, determining a risk for dysphagia.^{34,35}

The scientific production from 2011 to nowadays has retaken themes already discussed in previous years, such as myofunctional disturbances in senescence occurred over the aging process and dysphagia in institutionalized elders, as well as the incidence of dysphagia post heart surgery and with the unit of intermediary care. However there was a change in focus in the scientific production, because the studies evaluated and analyzed the deglutition of healthy elders, highlighting the quality of life and deglutition of these patients.

There was the beginning of clinical studies approaching the intervention and importance of Speech, Language Pathology and Audiology therapy to attenuate the facial aging, with emphasis in esthetics and not in the functionality of the facial structures. The direction of Speech, Language Pathology and Audiology intervention to the matters of facial esthetics relates the impact of the work of the muscles of the face,^{37,38} approaching the importance of the professional in this recent area, which is esthetic Speech, Language Pathology and Audiology therapy.

A research in 2012 searched to find the self-perception of the healthy senescent individuals facing the possible dysphagic signals.³⁶ It was understood that healthy elders didn't refer to meaningful alterations over life quality in swallowing. However, they describe an increase in the total time of feeding, as possible adaptations so that the difficulties of deglutition don't occur and it can be safe and efficient. Besides this, it was detected that there is a decrease in life quality through deglutition with the passing of age, corroborating with other studies previously developed. It has been comprehended that there is the necessity of researching more about this theme, because the literature findings originated questionings about the difficulties related to the dynamic of feeding and deglutition of the senescent elders, questioning if these clinical manifestations occur in an exclusive way due to the aging process, or if they are mainly associated to base diseases that in general commit the senescent patients.

The scientific production in the area of orofacial motricity describes an organization of the analysis line with a beginning in the anatomical and physiological aspects inherent to the aging process, its functional impact in the quality of life of the

elderly population, the rehabilitation of orofacial structures and the functional repercussions, mainly regarding dysphagia and its esthetic implications, accompanied by studies from other areas alike.

Conclusion

The reviewed literature shows us that Speech, Language Pathology and Audiology have dedicated itself to Gerontology in a wide and diversified way ranging from themes that involve the anatomical and physiological aspects; intervention in pathologies already inherent and/or developed, culminating with the search for perception in the senescent population about the organic aging that is undeniable to every living being.

It was noted a considerable amount of literary findings. In Audiology and Motricity, we observed a bigger commotion and search from the researchers about new discoveries.

It was also noted that among the enriching findings correlating the areas of Speech, Language Pathology and Audiology with Gerontology, a tendency of action towards rehabilitation and not on the aspects of prevention.

The Speech, Language Pathology and Audiology advancements depicted in the studies of audiology bring the interface with the language in developing researches, relating the adaptation of the PSAP to the alterations of the auditory processing. In the mid of 2007, the studies about voice evaluated the aging process in an objective way, through acoustic analysis, initiating results based on evidence.

In language, the advances in the studies relate the socio-economical integration of the elder into their linguistic development, by depicting the difficulty of literacy resulting not only to visual and auditory alteration.

In orofacial motricity, the advances showed enrichment in gerontology searching for interdisciplinarity of areas alike, such as: Odontology, Cardiology and Dermatology in the quality of life of the elder. The areas of voice, language and motricity analyzed the active aging while studying the healthy elder.

References

1. Instituto Brasileiro de Geografia e Estatística: média da idade do brasileiro no último censo. <http://ibge.gov.br> (Acessado em Out/2018).
2. Dawalibi NW, Anacleto GMC, Witter C, Goulart RMM, Aquino RC. Aging and quality of life: Analysis of scientific production in SciELO. *Estudos de Psicologia*. 2013; 30(3): 393-403
3. Pinto RBR, Bastos LC. Abordagem das pesquisas de epidemiologia aplicada a Gerontologia no Brasil: revisão da literatura entre periódicos de 1995 e 2005. *Revista Brasileira de Epidemiologia* 2007; 10(3): 361-9.
4. Acosta NB, Cardoso MCAF. Presbifagia: estado da arte da deglutição do idoso. *RBCEH* 2012; 9(1): 143-154.
5. Paula JC, Cintra FA. The relevance of physical examination of the elderly patient in the nursing assistance hospital. *Acta Paul Enferm*. 2005; 18(3): 301-6.
6. Ciosak SI, Braz E, Costa MFBNA, Nakano NGR, Rodrigues J, Alencar RA, Rocha ACAL. Senescence and senility: the new paradigm in Primary Health Care. *Rev Esc Enferm USP*. 2011; 45(Esp. 2): 1763-8.
7. Moraes GI, Couto EAB, Cardoso AFR, Labanca LM. A communication profile of elderly people assisted in a reference center. *Distúrbios Comun*. 2016; 28(1): 82-92.
8. Gonçalves AS, Cury MCL. Assessment of two central auditory tests in elderly patients without hearing complaints. *Braz J Otorhinolaryngol*. 2011; 77(1): 24-32.
9. Assis M et al. Evaluation of a health promotion project at the Elderly People's Care Center: an exploratory study. *Interface - Comunic.Saúde, Educ*. 2009; 13(29): 367-82.
10. Costi BB, Olchik MR, Gonçalves AK, Benin L, Fraga RB, Soares RS, Teixeira AR. Perda auditiva em idosos: relação entre autorrelato, diagnóstico audiológico e verificação da ocorrência de utilização de aparelhos de amplificação Sonora Individual. *Revista Kairós Geront*. 2014; 17(2): 179-92.
11. Veras RP, Mattos LC. Audiologia do Envelhecimento: revisão da literatura e perspectivas atuais. *Rev. Bras. Otorrinolaringol*. 2007; 73(1): 128-34.
12. Laperuta EB, Fiorini AC. Satisfaction of elderly individuals with hearing aids in the first six months of use. *J Soc Bras Fonoaudiol*. 2012; 24(4): 316-21.
13. Batista ACM, Sampaio FM. Nível de satisfação dos idosos usuários de Próteses auditivas doadas pela APAC-NAMI-UNIFOR. *RBPS*. 2005; 18(1): 7-10.
14. Soyama CK, Espassatempo CL, Gregio FN, Camargo Z. Voice quality in elderly: long-term acoustic parameters of male and female voices. *Rev CEFAC*. 2005; 7(2): 267-79.
15. Cielo CA, Ribeiro VV, Hoffmann CF, Gomes AM, Machado FCM. Maximum phonation times of elderly woman with and without upper dental prosthesis. *Rev. CEFAC*. 2015; 17(3): 745-50.
16. Fialho IM. Percepção de Idosos sobre o uso de AASI concedido pelo Sistema Único de Saúde. *Rev. CEFAC*. 2009; 11(2): 338-344.



17. Santos SB, Rodrigues SR, Gadenz CD, Anhaia TC, Spagnol PE, Cassol M. Verifying the effectiveness of using resonance tubes in voice therapy with elderly people. *Audiol Commun Res.* 2014; 19(1): 81-7.
18. Silveira DN, Brasolotto AG. Reabilitação vocal em pacientes com doença de Parkinson: fatores interferentes. *Pró-Fono Revista de Atualização Científica* 2005; 17(2): 241-250.
19. Beber BC, Cielo CA. Vocal acoustic characteristic in men with normal voice and laryngeal. *Rev. CEFAC.* 2011 Mar-Abr; 13(2): 340-351.
20. Mifune E, Justino VSS, Camargo Z, Gregio F. Acoustic analysis of aging voice: fundamental frequency characterization. *Rev CEFAC.* 2007; 9(2): 238-47.
21. Diaféria G, Madazio G, Pacheco C, Takaki PB, Behlau M. Group climate in the voice therapy of patients with Parkinson's Disease. *CoDAS.* 2017; 29(4): 1-8.
22. Mifune E et al. Análise acústica da voz do idoso: caracterização da frequência fundamental. *Rev. CEFAC* 2007; 9(2): 238-47.
23. Magalhães LA, Bilton TL. Avaliação de linguagem e deglutição de pacientes hospitalizados após acidente vascular cerebral. *Rev. Distúrbios da Comunicação* 2004; 16(1): 65-81.
24. Oliveira CC, Stivanin L. A nomeação de figuras e o acesso lexical na demência de Alzheimer: um estudo de caso. *Rev. Distúrbios da Comunicação Humana* 2005; 17(3): 359-364.
25. Garcia FHA, Mansur LL. Habilidades funcionais de comunicação: idoso saudável. *Rev. ACTA FISIATR* 2006; 13(2): 87-89.
26. Filho PPS, Massi GAA. A influência da estrutura de um grupo na linguagem escrita de idosos: um estudo de caso. *Rev. Soc. Bras. Fonoaudiol.* 2011; 16(3): 350-355.
27. Mello JG et al. Subjetividade e institucionalização no discurso de idosos. *Rev. Distúrbio da Comunicação.* 2013; 25(1): 35-45.
28. Bazza AB. A constituição da subjetividade no discurso do idoso sobre si. *Ling Disc.* 2016; 16(3): 449-64.
29. Santos GAA, Lucena BTL, Vasconcelos ML, Delgado IC. Aspectos sociais, linguísticos e cognitivos na terceira idade. *Rev. ProLingua.* 2013; 8(2): 244-257.
30. Camargo GF, Frigerio MLR, Arantes MLM. Avaliação fonoaudiológica x autopercepção de saúde bucal em idosos após a instalação de próteses dentárias. *Rev. Assoc. Paul. Cir. Dent* 2008; 62(4): 299-306.
31. Amaral AKFJ, Silva HJ, Cabral ED. Fatores determinantes do tempo de maceração dos alimentos em idosos edêntulas totais. *Rev. CEFAC* 2009; 11(3): 398-404.
32. Roque FP, Bonfim FMS, Chiari BM. Descrição da dinâmica de alimentação de idosos institucionalizados. *Rev. soc. bras. fonoaudiol.* 2010; 15(2): 253-66.
33. Favero SR, Scheeren B, Barbosa L, Hoher JA, Cardoso MCAF. Clinic Complications of dysphagia in patients admitted to an ICU. *Distúrb Comum.* 2017; 29(4): 654-62.
34. Almeida TM, Cola PC, Magnoni D, França JID, Silva RG. Prevalence of oropharyngeal dysphagia in stroke after cardiac surgery. *Rev. CEFAC.* 2015; 17(5): 1415-19.
35. Dantas MORL, Júnior JOCA, Andrade CRF. Avaliação da deglutição de idosos com indicação de revascularização miocárdica. *Pró-Fono R. Atual. Cient.* 2010; 22(4): 385-390.
36. Cassol K et al. Qualidade de vida em deglutição em idosos saudáveis. *J. Soc. Bras. Fonoaudiol.* 2012; 24(3): 223-32.
37. Frazão Y, Manzi SB. Eficácia da intervenção fonoaudiológica para atenuar o envelhecimento facial. *Rev. CEFAC* 2012; 14(4): 755-762.
38. Silva NL, Vieira VS, Motta AR. Eficácia de duas técnicas fonoaudiológicas da estética facial no músculo orbicular dos olhos: estudo piloto. *Rev. CEFAC* 2010; 12(4): 571-578.

