

# RIASE

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## HEARING AND LANGUAGE CHANGES IN ELDERLY: INTEGRATIVE REVIEW

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## ABSTRACT

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**Objective:** to identify hearing and language changes in the elderly that indicate the need for a speech-language assessment.

**Method:** an integrative review study, conducted in February/March 2018, at the Medline database through the PubMed search engine, and at the virtual libraries/bibliographic repositories SciELO, LILACS and Science Direct, selected through pre-established criteria and analyzed by thematic categories.

**Results:** 13 articles met the established criteria. The main aspects found on hearing were: relationship of hearing loss to presbycusis or hearing loss with communication leading the elderly to frustrating behaviors. As for the language, the lack of or bad memory, whether transient or degenerative, being associated or not with hearing loss.

**Conclusion:** It was possible to list the main characteristics of presbycusis and the language aging that will be used to construct the checklist that will screen hearing and language disorders of the elderly by non-speech and language professionals.

**Descriptors:** Aged; presbycusis; speech, language and hearing sciences; hearing; language.

## INTRODUCTION

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Brazil has been undergoing socioeconomic transformations. Among them, the reduction in the number of young people and the increase in the elderly population, requiring, from public policies and professionals, actions aimed at prevention, promotion and rehabilitation of health. These actions aim to optimize the functional capacity of the communication and improve the quality of life of these individuals<sup>(1-4)</sup>.

Population aging is characterized by a constant increase in life expectancy and decrease in fertility. This phenomenon occurs globally, leading to a demographic transition and modifying the shape of the age pyramid. Therefore, the understanding of the physiological changes resulting from the aging process has been the focus of studies in the health area. It is important to consider that aging is a natural and irreversible process and, with it, biological, social and psychological changes occur gradually<sup>(5-8)</sup>.

The changes that accompany the aging process can affect communication, highlighting the hearing impairment as a sensory deprivation of greatest impact. This kind of problem tends to lead the individual to isolation, in order to avoid situations of communication that are threatening, hindering them to play their full role in society and generating profound psychosocial problems<sup>(9-13)</sup>.

The National Health Policy for the Disabled Person makes reference to the international literature defining presbycusis as the hearing loss due to age, which has been pointed out as the main cause of hearing impairment in the elderly. Its prevalence is of approximately 30% of the population aged over 65 years<sup>(14)</sup>.

The hearing-impaired elderly experience moments of great frustration by the inability to understand what family and friends say. For this reason, the typical complaint of patients with presbycusis is that they "listen, but cannot understand what is said". Therefore, family members perceive them as confused, disoriented, little communicative, or collaborative, angry and even unfairly senile people<sup>(15-19)</sup>.

Directly related to language, cognitive changes that arise with advancing age are associated with the decline of three fundamental features of cognitive processing: the speed of information processing, working memory and sensorial and perceptual skills. The decreased speed of information processing and response, slower execution of perceptual components and mental operations may affect attention, memory and decision making, also influencing the execution of tasks that do not require speed<sup>(20-24)</sup>.

Reflecting on the theme related to aging and thinking of the difficulties health professionals have to send the elderly to a speech and language therapist, this study sought to answer the following guiding question: what aspects of the hearing and language of the elderly need speech and language therapy evaluation?

Therefore, this study aimed to identify the changes of hearing and language in the elderly who indicate the need for a speech-language evaluation. Thus, it will be possible to build a checklist for screening such changes, by non-speech and language health professionals, and from the results, send the elderly to the speech and language therapist.

## METHOD

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This was a review study, with integrative approach, built by means of analysis of articles available online at databases, MEDLINE through PubMed search engine, and at virtual libraries/bibliographic repositories SciELO, LILACS and Science Direct. The PubMed comprises millions of citations from biomedical literature of MEDLINE, in addition to life sciences journals and online books.

Academic research in clinical practice emphasizes the importance of the impact not only for the development of policies, protocols and procedures, but also for critical thinking required by the daily practice<sup>(19)</sup>.

In this sense, were outlined the six phases in the elaboration process of the integrative review. The first phase consisted of the elaboration of the guiding question, which consists of a questioning that directs the study within the theme: What aspects of the hearing and language of the elderly need speech and language therapy evaluation?

The second phase comprised the search for articles at databases and virtual libraries/bibliographic repositories, having been held in February and March 2018. For the advanced search, the following descriptors were used: aged *and* speech, language and hearing sciences *and* communication and their respective terms in Portuguese and Spanish. The filters were: full text written in Portuguese, English or Spanish; available in its entirety; published in the last 10 years (2008-2017).

The inclusion criteria were articles that presented the following descriptors previously defined in the context of the theme: "aged" and "speech, language and hearing sciences" and "communication" and/or "presbycusis". The exclusion criteria were: repeated publications or manuscripts and letters to the editor, theses, dissertations, monographs, books, chapters of books, manuals and summaries; studies that did not address the elderly, case studies or experience reports and literature review articles. The articles were screened, and had to contain the descriptors aged, communication, presbycusis.

Then, in the third phase was performed analytical reading of: abstract, method and the conclusion of the articles, using a structured guide for data collection, containing the following variables: year of publication; title; type of study; communicative changes addressed; data collection instrument; main results.

The fourth phase consisted of organizing the information collected in an instrument in Excel® spreadsheet format. Then, in the fifth phase was held a discussion of the results from their interpretation and synthesis, comparing the data found in each selected article with the literature on the topic.

The sixth phase consisted of presenting the results in a table containing the information about the articles. The data were structured based on the variables set out in the data collection instrument, allowing for a better understanding and comparison between the selected articles, allowing for the distribution in thematic categories as part of the discussion.

## RESULTS

Of the 1,486 selected articles, 139 were from the LILACS, 841 were obtained through PubMed, 127 were extracted from Medline, 71 from the virtual library/bibliographic repository SciELO and 308 from the virtual library/bibliographic repository Science Direct (Figure 1). After applying the exclusion criteria, 13 articles were selected for the study, organized in Table 1.

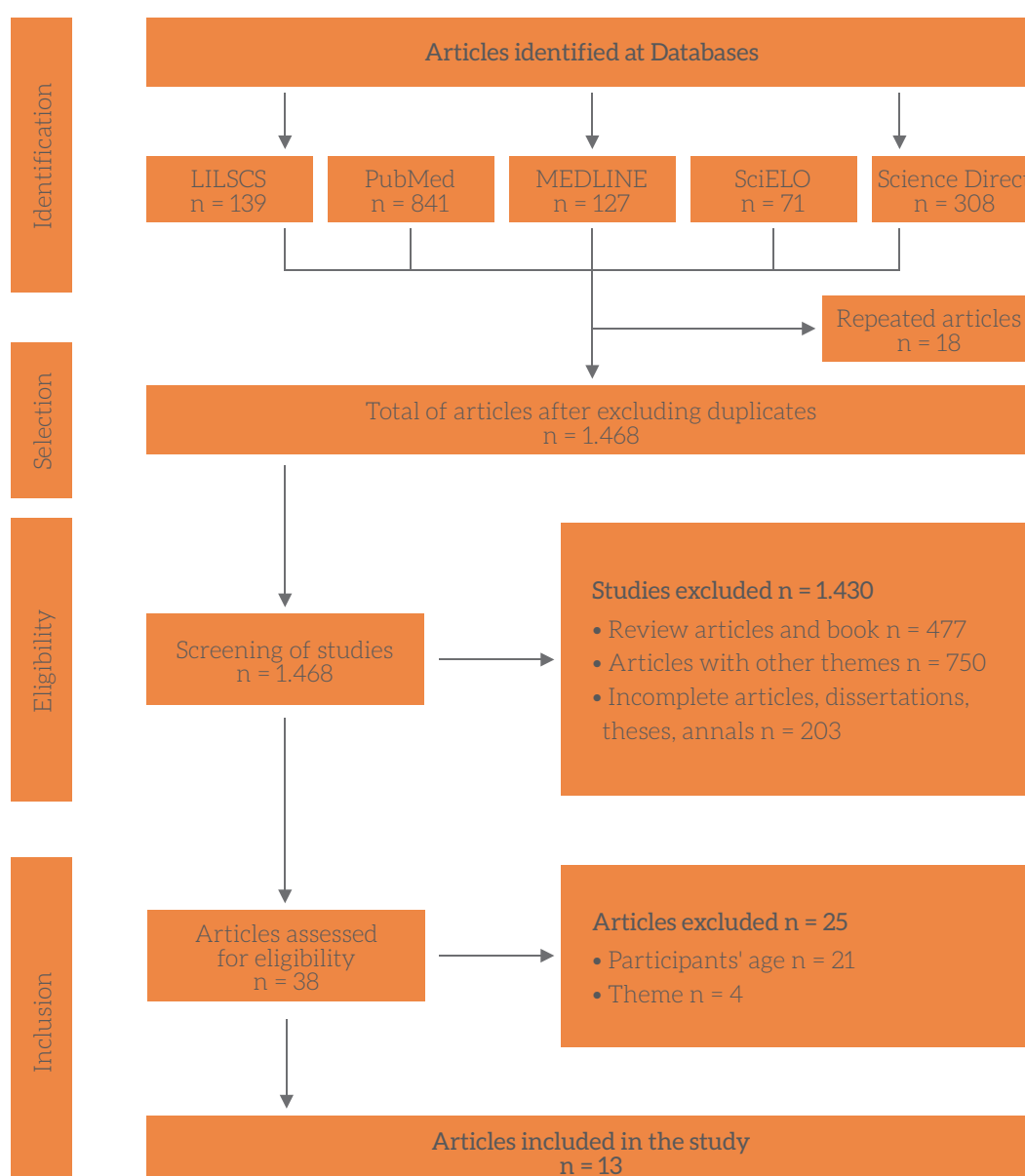


Figure 1 - Search sequence for publications at databases/virtual libraries/bibliographic repositories, with hearing and language changes in the elderly, indicating the need for a speech and language evaluation, as recommended by the PRISMA group. João Pessoa, PB, 2008-2017 (n=13).

Tabela 1 – Selected publications, according to established criteria, with hearing and language changes in the elderly, indicating the need for a speech and language evaluation. João Pessoa, PB, 2008-2017. (n=13)

Title	Objective	Hearing and Language changes	Collection Instruments	Main Results
Characterization of the elderly health in a Speech and Language Therapy perspective.	To estimate the prevalence of oral communication, memory, reading and writing, voice and oral motor skills problems in elderly people.	General difficulty speaking; pronouncing the name of objects correctly, remembering stories or names and generically expressing, understanding.	Questionnaire.	Difficulties in comprehension and oral expression and reduced hearing acuity.
The knowledge of healthcare professionals about augmentative and alternative communication in the long term care institutions for the elderly.	To analyze the knowledge of professionals that work in the long-term care institutions.	The longer the time since graduation, the more knowledge the professionals had.	Questionnaire.	Deficit in speech and language therapist's education in the intervention with CSA.
Correlations between the audiological evaluation and cognitive screening in elderly.	To investigate the relationship between the listening performance for pure tone, speech and cognitive performance in elderly patients.	Auditory decline, cognitive impairment.	Tone and vocal audiometric assessment; MMSE.	There was no association between hearing loss and cognitive decline in the sample studied. But analyses between speech recognition increase the chance of cognitive impairment.
Performance of elderly adults with binaural vs. Monaural fitting in speech tests in silence and in noise.	To evaluate the sentence recognition in silence and in noise, by elderly individuals with symmetrical hearing loss, users of hearing aids to investigate in which of the situations it may be verified the best performance under conditions that simulate daily communication situations.	Hearing loss and cognitive impairment.	MMSE, audiometric assessment and PISR.	The greater the hearing loss and the decline in hearing acuity, the worse the cognitive performance.
Performance of elderly in a speech in noise test.	To characterize and compare the auditory abilities of the elderly in monotic speech perception test, without and with the presence of competitive noise.	Symmetrical sensorineural hearing loss.	Medical records data.	Losses in speech sound recognition in the presence of competitive noise; the older the person is or the greater the hearing loss, the greater the difficulty understanding spoken language.

Tabela 1 – Selected publications, according to established criteria, with hearing and language changes in the elderly, indicating the need for a speech and language evaluation. João Pessoa, PB, 2008-2017. (n=13)

Title	Objective	Hearing and Language changes	Collection Instruments	Main Results
Self-declared communication disorders and associated factors in the elderly.	To identify self-reported speech-language disorders and associated factors in an elderly population.	Decline of hearing functions and hearing loss.	Questionnaire.	There are important changes in the communication process regarding hearing loss, even mild. Speech disorders may be due to changes in motor skills and/or orofacial and/or hearing functions.
Global functionality of hospitalized elderly.	To identify the global functionality of hospitalized elderly, correlating the performance to basic and instrumental activities of daily life, with the main functional systems.	Decline of hearing and language.	Katz Scale, MMSE, Geriatric Depression Scale, Time Up and Go Test, Communication Functionality Assessment.	The elderly were semi-dependent for ADL, with preserved autonomy, impaired independence due to regular mobility and a moderate need for communication assistance.
Activity limitations in the elderly: a study of new hearing aid users using the APHAB questionnaire.	To evaluate hearing limitations among elderly individuals with moderate to severe sensorineural hearing loss according to the variables educational level and degree of hearing loss.	Auditory function deterioration.	MMSE, Geriatric Depression Scale Questionnaire, APHAB.	Reduced limitation in subscale activities: ease of communication, reverberation and environmental noise with the use of hearing aids. Benefit obtained in environmental noise.
Otological complaints and concerns and communication difficulties of aged individuals.	To investigate the otological complaints and concerns of aged individuals, as well as the communication difficulties they face.	Hearing Loss.	Interview and hearing tests.	The complaint of hearing loss influenced the otological complaints of tinnitus and the difficult communication.
Time-compressed speech test in the elderly.	To evaluate the performance of elderly people in the time-compressed speech test.	Hearing loss, poor performance in hearing closure ability, increased speech rate of the speaker.	SCALE Questionnaire of Auditory Behaviors - SAB; CD; Behavioral hearing tests; audiometer; headphones; notebook.	Worse performance in the hearing closure ability, when evaluated by compressed speech test, compared to adult individuals. Difficulty recognizing speech when at increased speed.

Tabela 1 – Selected publications, according to established criteria, with hearing and language changes in the elderly, indicating the need for a speech and language evaluation. João Pessoa, PB, 2008-2017. (n=13)

Title	Objective	Hearing and Language changes	Collection Instruments	Main Results
The development and standardization of Self-assessment for hearing screening in the elderly.	To develop and standardize a screening tool for the elderly.	Hearing loss, difficulty understanding speech in a noisy environment and fast speaking by the speaker.	Questionnaire.	The construction of SHSE, a hearing screening tool for the elderly.
The development of the geriatric index of communication ability (GICA) to measure communicative competence of the elderly: a pilot study.	To develop a Geriatric Index of Communication Ability and verify its reliability and validity.	Hearing loss.	Literature review.	Construction of the GICA.
Auditory training: assessment of the benefit of hearing aids in elderly individuals.	To verify the effectiveness of auditory training in elderly individuals, new users of hearing aids, regarding the benefit in fitting.	Hearing loss, changes in auditory processing.	Otoscope, audiometer, acoustic booth, APHAB questionnaire, dichotic listening test, monotic noise test.	The acoustic booth auditory training program helped improve the performance of auditory processing skills.



## DISCUSSION

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The hearing is one of the five senses of the human body, which allows us to hear. The hearing loss associated to aging, called presbycusis, is a phenomenon with high prevalence in the elderly population, and can lead to a series of difficulties in oral communication, family and social interaction. It affects the quality of life, by psychosocial implications arising from this degeneration. The misunderstood speech initially limits the communication in the family, among friends and subsequently involves other leisure and social activities, such as the use of telephone, radio, television and the group meetings<sup>(15,18,23,25)</sup>.

Language has several senses: oral, written, through images, mimes, with just one look, symbology and depending on with whom one communicates, it is possible to adapt this form of communication to be understood and enjoyable between the speaker and the receiver. Studies on the language of the elderly have sought to identify transformations and detect the causes of possible changes that occur in the aging process<sup>(6)</sup>.

However, the studies in Speech and Language Therapy in Brazil related to the language of the elderly still focus on aphasia and dementia, with few focusing on the language in healthy aging, pointing to preventive actions seeking a better quality of life<sup>(6-8)</sup>.

The language is present in human life and differs according to the context, situation and content. It appears spontaneously and occurs as the listener is, or is not, understood. In a general way, it covers everything one wants in a communication. It constitutes one of the fundamental aspects of a person's life. It is the way one expresses experiences, ideas, thoughts and feelings, since the ability to communicate is an instrument of social interaction by excellence. The comprehension and expression involve a conceptualization of symbolic forms (words) and their combination within certain rules (grammar)<sup>(6-8)</sup>.

With the aging process, some modifications of language related to memory and interpretations of stories may appear; however, this fact should not deprive the elderly of their daily activities<sup>(13)</sup>. The loss of cognitive functions, mainly the memory failures, is associated with aging, bringing a very remarkable impact in the life of the individual. Therefore, this study screens changes of communication in the scope of the hearing and language in the senescent elderly<sup>(25)</sup>.

The titles of the articles analyzed for this study relate hearing with language already providing preliminary indications of the crucial intertwining of these aspects. Hearing and language are not communicative conditions separate, independent. Communication strictly requires a hearing, provided that there is comprehensive language<sup>(8-10)</sup>.

In this sense, the contents of the selected articles were divided didactically into thematic categories, namely: category 1 – the importance of the hearing for the elderly and category 2 – the need for understanding and expressing the language for the elderly.

### *The importance of the hearing for the elderly*

Most articles (12 out of 13) related hearing loss with presbycusis (aging-related hearing loss) as a hearing impairment or even as something natural of the aging process. The hearing loss was considered as predominant factor for the difficult communication. Among them, two articles associated hearing loss to the central auditory processing changes and auditory and cognitive decline.

Presbycusis or aging-related sensory hearing loss can become one of the most incapacitating communication disorders. The lowering of the thresholds in the high frequencies, typical of this type of loss, worsens the perception of the consonantal sounds during communication especially in noisy environments, generating, in the elderly, the frequent complaint of "listening, but not understanding"<sup>(5,8)</sup>.

Another important condition highlighted in articles refers to the fact that the elderly feel uncomfortable when someone else "speaks too fast", which delays their ability to receive the message in a conversation, affecting the effective communication due to failure in the auditory processing<sup>(9-11)</sup>.

Concomitantly with the "fast speech", there is the "speaking too loud". There are reports that the elderly presume that the voice becomes shrill; on the other hand, if one speaks quietly, they tend not to understand, reporting that they do not listen and ask to repeat. Therefore, such situation may become embarrassing to the elderly, who eventually give up the dialog, tending to isolate themselves. In these cases, there occurs the emergence of signs of depression or even aggressive behaviors, often requiring a specialized professional assessment of the geriatric area<sup>(1,7)</sup>.

The aging itself causes several losses in the body as a whole. Such losses are associated with the deterioration of the body, the decline, incapacity and loss of vitality, and, in this way, in the ear, it is not different. As years pass by, there is a gradual loss of the ability to listen. Older people affected by this situation tend to present behaviors of isolation, saying they had heard, but could not understand, that the noise bothers as there is no way to understand due to an environment that does not allow for listening perfectly, with a lot of noise, tending to present irritability. These behaviors should not be ignored simply because they may be part of the aging process; young adults and/or even young teenagers or people of their conviviality must be alert to the first signs of hearing loss, offering sup-

port and sensitizing the elderly to seek an Speech and Language Therapist, initiating the first segments for a comprehensive dialog without causing communicative stress<sup>(9-10)</sup>.

The use of hearing prostheses allows for the rescue of the perception of speech sounds, in addition to environmental sounds, promoting the improvement of the ability to communicate. The well-adapted patient will have greater ability to communicate, increased self-confidence, greater attention and understanding of information that are important factors in a preventive and rehabilitative interaction. Nevertheless, in practice, there are other issues involved, such as the resistance to use the prosthesis, with a discourse that it brings a type of tinnitus, bothering noises, or that they sometimes cannot hear anything. Nonetheless, they may be with decreased volume, off or even with exhausted batteries, which lead to the discontinuance of use. The period of adaptation to the prosthesis requires its correct handling (sanitizing, learning how to connect and disconnect; time of durability of the batteries) and appropriate coupling of the sound amplification device to the ear<sup>(16-18)</sup>.

Another important point refers to the question of the in-booth auditory training (when the auditory route is too compromised even after the adaptation to ISAD (individual sound amplification device) and the cochlear implant (CI) and the abilities of auditory processing (selective attention, understanding, storage and retrieval), which may have many complaints mainly of speech understanding when the caller speaks faster or in noisy environments. However, the auditory abilities have shown to improve after auditory training when a study reported that auditory processing difficulties characterized auditory discrimination, speech understanding in noisy or reverberating environment, difficulties to speak on the phone and deficit of auditory memory and behavior, as well as highlighted the presence of central auditory dysfunction<sup>(17-19)</sup>. The results show improved auditory processing abilities and speech understanding in noisy and reverberating environments, as well as the quality of life of the elderly.

### *The need for understanding and expressing the language for the elderly*

As regards the language, the greater difficulty of communication relates to memory, whether temporary or degenerative, and the decreased overall functionality of the elderly intensifies this difficulty. "Avoiding communication" was one of the most reported communication abilities in most of the studies. Possible difficulties in understanding and oral expression, as well as reduced auditory acuity, or even in emotional and/or mood problems, restrict the social participation of individuals<sup>(23-25)</sup>.

We have all forgotten something in our day-to-day. It is part of our life and routine, which we bear with stress and anxiety, and these factors favor the cerebral overload, causing forgetfulness of small things from our routine or even failures in an oral communication during a dialog. This phenomenon is called memory loss, with transitory nature. In this, most causes are preventable or reversible, with better living habits, such as meditation, relaxation techniques and memory training. Nevertheless, these factors, associated with the aging process, together with more serious behaviors, such as aggression, apathy, disinterest, delirium, paranoias, among others, should be investigated with more detail<sup>(20-22)</sup>.

The aging process makes the individual more susceptible to cognitive losses, which can be from lack of attention or mild oversights to severe loss of memory. However, memory loss of transitory nature cannot be confused with degenerative loss, which is progressive, causing irreversible damage to the brain<sup>(22-24)</sup>.

The overall functionality of the elderly identifies their health. It is defined as the ability to manage one's own life or take care of oneself, influenced by the degree of autonomy and independence of the individual. Furthermore, the integrated and harmonious development of the activities of daily living with cognition, mood, mobility and communication allow for assessing the elderly as healthy or not, even with some disease<sup>(19-21)</sup>.

The cognitive decline is related to different biopsychosocial variables in the elderly and sensory deficits may settle gradually over several years, being initially little perceived, but causing restriction in routine activities and reduction in functionality and independence. Individuals who suffer from such limitations are at higher risk of developing cognitive decline, social isolation and depressive disorder, with decreased quality of life. In this sense, the integrity of cognitive functions is important for a good communication, with the hearing, language and memory as prime factors in the process of quality of life of the elderly<sup>(2-6)</sup>.

Among the instruments of collection for the investigation of the language, the MMSE (Mini Mental State Examination) was frequently used, developed in the United States of America and published in 1975. Its goal is to quickly evaluate possible cognitive declines related to mental functions that involve spatial and temporal orientation, immediate and late evocation of words, attention, language and visual and spatial construction<sup>(21)</sup>. It is composed of two sections that measure cognitive functions. The first contains items that assess orientation, memory and attention, totaling 21 points; the second measures the ability of naming, executing a verbal command and writing, free writing of a sentence and copy of a complex drawing (polygons), totaling nine points<sup>(31)</sup>. Currently, the MMSE is the cognitive screening test for adults and elderly people most used in the world<sup>(18)</sup>.

The articles selected within the two thematic categories in the present study cited the changes of hearing and language as a factor of prevalence in relation to the losses in the communication, leading to social isolation, changes in social life, stress and depression. They also increase the risk of making the elderly more susceptible to diseases, revealing that the higher the hearing loss and the decline in auditory acuity, the worse the cognitive performance<sup>(1-5)</sup>.

Considering the difficulty understanding the language spoken mainly in situations with a noisy environment, the literature shows that the greater the degree of hearing loss, the greater the difficulty to understand the spoken language. This characteristic was found in two studies conducted in Korea involving the difficulty of communication in relation to the understanding and expression of elderly patients presenting the hearing loss as one of causal factors for this ability. The first study consisted of the screening hearing self-evaluation (SHSE) in the elderly, with 20 questions based on the characteristics of presbycusis using a five-point scale, and the second study used a tool to measure the ability to communicate of the elderly, which featured two versions, in which the first explored the content validity and the second, a questionnaire and review of experts for the final production (GICA), organized into three questions in each of the six domains: hearing, language comprehension and production, attention and memory, communication efficiency, voice and reading/writing/calculation. Therefore, the GICA proved to be very useful in the early identification of people with communication difficulties among the elderly<sup>(11-12)</sup>.

This study underscores the importance of a checklist to screen hearing and language changes in the elderly by health professionals who are not speech and language therapists. This is due to the fact that articles demonstrated that the difficulty hearing and decline in the language in this population result in consequences in receptive and expressive communication, since they are areas of the speech and language therapy that need to be considered for the elderly in order to promote the promotion/recovery, providing them with a better quality of life and promoting self-esteem.

As a limitation, there are few articles that address language changes, perhaps because they are connected with hearing changes; knowing that, once the elderly with difficulty to listen have difficulty to communicate, their language also becomes impaired.

## CONCLUSION

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There is a relationship between hearing loss associated with presbycusis or hearing disabilities with communication, leading the elderly to present frustrating behaviors in their day-to-day, such as the difficulty understanding and expressing the language that can damage the social interaction, increase stress, and risk of depression.

Articles about presbycusis define it as a hearing disability, and others, as a hearing loss due to the aging process. There is lack of consensus regarding the definition of the term.

The lack of or bad memory, whether temporary or degenerative, was also pointed out in articles as a causal factor for the difficult communication, being associated, or not, with hearing loss, presenting possible difficulties in understanding and oral expression.

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