Improvements in Psychomotor Intervention in Elderly People with Hearing Difficulties

Melhorias na intervenção psicomotora em pessoas idosas com dificuldades auditivas

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Abstract.
Hearing loss is common in people over 65 years of age, and the objective of this study is to learn about improvements in the processing and speech perception of the elderly with hearing difficulties, to perceive the evolution of brain functions, and to analyze behavioral and significant improvements in the auditory threshold. As a methodology, we used a literature review, using Google Academic as a search basis. Inclusion criteria included articles focusing on hearing problems in the elderly, using quantitative and/or qualitative methodology that clarified interventions in elderly. Hearing impairment leads to difficulties in understanding speech, and can lead to isolation. However, when the diagnosis is made early there is a decrease in the impact on the social relationship. Cochlear implants have benefits in terms of speech perception and brain functions, and the psychomotricist intervenes in the adaptation and rehabilitation phase. In addition, the auditory rehabilitation program leads to a reduction in auditory handicap, and after the program there is a better communication potential, and a consequent social reintegration.

Keywords: Aging, Elderly, Hearing Loss.

Resumo
A perda auditiva é comum em pessoas com mais de 65 anos de idade, e o objetivo deste estudo é conhecer melhorias no processamento e na perceção da fala de idosos com dificuldades auditivas, perceber a evolução das funções cerebrais e analisar comportamentais, e melhorias significativas no limiar auditivo. Como metodologia, utilizou-se a revisão da literatura, utilizando o Google Academic como base de busca. Os critérios de inclusão incluíram artigos com enfoque em problemas auditivos em idosos, utilizando metodologia quantitativa e/ou qualitativa que esclareceu intervenções em idosos. A deficiência auditiva leva a dificuldades na compreensão da fala e pode levar ao isolamento. Porém, quando o diagnóstico é feito precocemente, há diminuição do impacto no relacionamento social. O implante coclear traz benefícios na percepção da fala e nas funções cerebrais, sendo que o psicomotricista intervém na fase de adaptação e reabilitação. Além disso, o programa de reabilitação auditiva leva à redução do handicap auditivo, e após o programa há um melhor potencial de comunicação e consequente reintegração social.

Palavras-chave: Envelhecimento, Idoso, Perda Auditiva.
1) Introduction

With the advancement of the centuries, and due to medical advances, average life expectancy has been increasing, contributing to a longer life and consequently an increase in the elderly population (1). Aging is a process of irreversible deterioration by the accumulation of sensory losses over time (2). Among these, hearing impairment, also known as presbycusis, is one of the most disabling, as it can lead the elderly to reduce social contact with others, promoting various emotional changes (2). Hearing is a fundamental act for the human being throughout life. It is through it that the human being becomes able to exercise communication (3). In turn, communication is considered as one of the dimensions of functionality, being fundamental to self-care (1, 4, 5).

Thus, hearing loss associated with aging results from physiological degeneration, such as damage caused by exposure to noise. It affects about 60% of people over 65 years of age, including a gradual downward change in hearing sensitivity for all frequencies. This is accompanied by a decrease in speech discrimination, and a complex decline in central auditory function (6). Hearing decay is a disability that limits the performance of the elderly person's social role (7). Hearing is one of the first senses to exhibit functional losses, beginning the process of auditory aging at around 30 years of age (7). Although this hearing aging is a slow process it will have a great impact on the life of the elderly, because together with other changes (biological, psychological and social) there is a decrease in the quality of life, which can lead to social isolation, due to the difficulty of communication capacity (7).

There is also an inability to understand speech in noisy environments during aging. This compromises the communicative role of the elderly in society, affecting the emotional and social side (7). Preventive interventions or interventions that minimize hearing difficulties can improve speech perception, mental activity and brain functions. In addition, they decrease isolation, improve self-esteem and interpersonal relationships, and the elderly may become more independent and confident (3).

Deafness is one of the main sensory deficiencies in aging that affect well-being. It is estimated by WHO (World Health Organization) that there are at least 466 million people with hearing impairment in the world (8). In Portugal, four out of ten elderly people have hearing problems. In Portugal, data from the latest National Health Survey and Physical Examination 2015 (9), point to an additional 1.6 million Portuguese with hearing difficulties among adults aged 25 to 75, approximately 23% of that population. The prevalence is even higher among the elderly between 65 and 75 years of age, where four out of ten elderly (40%) have difficulties hearing a normal conversation, even in silent environments.
For an adequate response from the health system, it is essential to know the care needs of elderly people (10). Thus, this literature review aims to deepen knowledge about the causes and consequences of hearing problems that affect the majority of the elderly population. One of our objectives is to study auditory processing in the elderly, the disorders caused by hearing aging, as well as the resources for reducing the mismatches in hearing skills involved in this auditory processing. We also intend to share the information obtained with the healthcare professionals working with this population in order to provide a better quality of life for the elderly and to reduce the effects of auditory disorders on this population.

2) Methodology

As a starting point for this literature review, the following question was formulated in PICO format: What are the indicators for improving psychomotor intervention in people over 65 years of age with hearing difficulties?

The electronic database used focused on the online platform Google Academic. As inclusion criteria, articles focused on hearing problems in the elderly, using a quantitative and/or qualitative methodology that clarifies interventions in elderly people. Regarding the participants (P), 372 elderly people from various institutions were included. Regarding intervention (I), interventions in elderly people (O) were included, articles demonstrating the relevant results for psychomotor intervention with elderly people with hearing difficulties were included.

The exclusion criteria include all articles with ambiguous methodology, all those with no correlation with the subject of study and with a date prior to 2003.

3) Results

Table 1 summarizes the main results of the studies included in the review.

<table>
<thead>
<tr>
<th>Author / Level of Evidence</th>
<th>Objectives</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author: Marques, Kozlowski e Marques (2004) (2)</td>
<td>Analyze the effect of hearing rehabilitation in an Orofacial Reading training intervention in elderly people with hearing difficulties</td>
<td>A significant reduction in auditory handicap perception was found in all subjects after the seven sessions, observed from the application of the HHIE-S pre and post auditory rehabilitation questionnaire.</td>
</tr>
<tr>
<td><strong>Methodology:</strong> experimental study</td>
<td>bilateral sensorineural hearing loss and users of unilateral sound amplification devices.</td>
<td></td>
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<tr>
<td><strong>Level of evidence:</strong> VI</td>
<td></td>
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<tr>
<td><strong>Participants:</strong> Seven participants with bilateral sensorineural hearing loss and users of unilateral sound amplification devices.</td>
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</tbody>
</table>

**Author:** Buss, Graciolli, Rossi (2010) (3)

**Methodology:** Non experimental study

**Level of evidence:** V

**Participants:** 12 elderly people

Study, through a theoretical review, the auditory processing in the elderly, the disorders that hearing aging causes, as well as the resources to reduce the mismatches in auditory processing skills

Auditory processing is a set of specific skills on which the individual depends to understand what he or she hears. It is a mental activity, i.e. a brain function. The way in which the auditory system receives, analyses and organizes what we hear is called auditory processing. In this description, the authors state that the behavioral improvements observed after auditory training are not related to changes in peripheral auditory processes, but to the central auditory nervous system.

Understanding the pathophysiology of aging, especially hearing aging, leads humans to be able to understand and thus contribute to the appropriate interventionist measures being applied, thus ensuring rehabilitation in time to minimize the adverse effects of this auditory disorder on this population.
<table>
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<tr>
<th>Author: Baraldi et al. (2007) (6)</th>
<th>Checking the degeneration of the auditory system in the course of age through supraliminal and auditory sensitivity measurements</th>
<th>According to the objective of this study, the deterioration of hearing sensitivity over the course of age can be assessed by obtaining the hearing thresholds for each frequency and by the percentage rate of speech recognition. Because of these limitations brought about by hearing impairment, early diagnosis is essential in order to reduce the impact on the individual's social relationship with the environment. As age progresses, there has been a gradual increase in the degree of hearing loss, and the audiometric configuration is descending, with greater loss of high frequencies in the 80-89 age group, with horizontalization occurring in individuals over 90 years of age. Segmentation of the intervention with priority in people over 80 years of age.</th>
</tr>
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<tbody>
<tr>
<td>Author: Castiglione et al. (2015) (11)</td>
<td>Analyze the results and complications of cochlear implant in elderly patients</td>
<td>No major complications were observed during postoperative follow-up (cochlear implant placement). Significant improvement in the auditory threshold and speech understanding. Improvements of 111.8dB in patients without hearing aids to 42.6dB with the cochlear implant. In addition, speech perception scores show a significant improvement in both the detection threshold and the perception threshold.</td>
</tr>
<tr>
<td>Author: Pinzan-Faria e Iorio (2004) (12)</td>
<td>To investigate whether there is a correlation between hearing sensitivity</td>
<td>There is a tendency for male elderly people to have more hearing loss and a greater perception of hearing handicap compared to females. There is variability in responses to</td>
</tr>
</tbody>
</table>
4) Discussion

Hearing impairments in the elderly population range from decreased hearing thresholds to difficulties in understanding speech, leading the individual to have communication problems and, consequently, to shrinkage and isolation from social life (6).

Due to these limitations brought about by hearing impairment, early diagnosis is essential in order to reduce the impact on the individual's social relationship with the environment (6). According to one study, hearing loss is the most frequent sensory deficit in man, and the need to create solutions to this problem arises (11). Cochlear implants are a good solution for the population we are studying, the elderly, since they benefit a lot from the use of the implant, at the level of speech perception and brain functions (11). After inserting the cochlear implant, individuals need some time to adapt and rehabilitate and it is at this point that the intervention of a psychomotorist is necessary to help the elderly recover speech perception, improve their auditory processing, minimize the effects of hearing disorders and gradually adapt to the new conditions (11). We cannot forget the importance of support from family and health professionals who facilitate the whole process, especially the recovery (11).

Elderly patients usually need a longer rehabilitation period than younger patients. The main complications associated with implant placement are dizziness and vertigo (11). Nevertheless, the results confirmed that the Cochlear Implant in elderly is a safe and effective procedure (11).

Another study proved that after participation in the auditory rehabilitation program based on Orofacial Reading training and orientation of situational and behavioral strategies, there was a reduction in the perception of the auditory handicap in all subjects (2). After the program, the subjects began to integrate better auditory and visual clues of the language, which made them improve their communication potential, contributing to their reintegration in the social...
environment (2). Several authors suggest that there are benefits in including elderly individuals with hearing problems in programs such as the one described; however, nowadays, more importance is given to the selection and adaptation of amplification devices, which often leads to the rejection of their use by the elderly, because they do not totally eliminate the difficulties presented (2).

Another study describes that hearing sensitivity decreases progressively, increasing at high frequencies, occurring more rapidly in men (12). This more pronounced occurrence in men is due to their participation in occupational activities, during their lives (12). Each individual will react differently to hearing loss, as this will be associated with their social adaptation, age and general physical health. Individuals with hearing loss exhibit a considerable handicap (12).

Another study concluded that the skill set that makes up auditory processing, i.e. the way the auditory system receives, analyses and organizes what we hear, is indispensable for the individual to be able to understand everything he/she hears (11).

By obtaining audibility threshold values we can assess hearing sensitivity throughout a person's life (6). Hearing loss in the elderly results in poor speech perception and consequently poor communication, preventing them from playing their role in society, often leading to social isolation (6). This social isolation will leave the elderly more and more vulnerable to other deficits, ending up leaving them more dependent on their caregivers (6). Thus, one of the existing alternatives to this hearing loss, and consequently to this isolation, will be the placement of cochlear implants, when and where possible (11). The placement of cochlear implants is a simple and effective procedure that will help in the recovery of much of the speech perception and auditory processing of these elderly people (11). However, we cannot only consider the placement of cochlear implants as a solution for the hearing loss of the elderly, since they only serve to amplify the sounds, so that the difficulties presented by the elderly are not totally eliminated (2). Then, it becomes necessary to complement this technique with interventions that allow learning strategies for understanding language, such as orofacial reading, which allow integrating auditory and visual cues of language, and it is in this field that psychomotoricists act, thus allowing the elderly to obtain improvements in understanding others (2).

5) Conclusion

Based on the articles we analyzed we reached some conclusions and results. We can begin by saying that through the process of auditory rehabilitation, and after a few sessions, a significant reduction in the perception of the auditory handicap can occur, and it is in the male gender that the greatest perception of the auditory handicap can occur, and it is the
gender where a greater hearing loss also occurs. In order for there to be timely rehabilitation that leads to a reduction in the adverse effects of the hearing disorder, it is important for these individuals to understand the pathophysiology of aging, so that they are able to understand and contribute to an application of the intervention measures of auditory rehabilitation.

In addition to auditory rehabilitation, there are other ways of intervening in this group of elderly people, in order to try to provide an improvement in their daily lives. We also have the cognitive-auditory training aspect, where great changes in speech processing are visible and consequently an improvement in speech perception.

Regarding the speech understanding part, improvements were also seen when the cochlear implant was placed, which also brings significant improvements in the auditory threshold. Hearing training brings behavioral improvements to these elderly people, and these same improvements are associated with the central auditory nervous system. Finally, as age progresses there is a progressive increase in hearing loss, leading to the audiometric configuration of the elderly in a descending form.

Thus, we can see that the main improvements in elderly people over 65 who have hearing difficulties are better brain function, better auditory processing and increased social contact with others.

As a way of avoiding the decrease in social contact due to hearing loss, it is very important to develop communication strategies to make it easier for the elderly to communicate with others, thus improving their quality of life.

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