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Restrictions in participation and mental state in new hearing aids users

Restrições de participação e estado mental: estudo em novos usuários de próteses auditivas

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ABSTRACT

Introduction: Hearing impairment may accentuate cognitive decline caused by ageing. **Purpose:** To study restriction of participation in daily activities and cognitive processes in new elderly hearing aids users. **Methods:** Fifty elderly individuals, all new users of amplification, with mild to moderately severe post-lingual symmetrical sensorineural hearing loss were evaluated. They were then divided into three groups according to the degree of hearing loss. The Hearing Handicap Inventory for the Elderly questionnaire and the Mini Mental State Examination were applied pre and post-fitting of the hearing aids (after 12 to 16 weeks). The analysis of variance and Bonferroni multiple comparisons with significance level of 0.05 were used as statistical analyses. **Results:** After acoustical stimulation through the use of hearing aids for 12 to 16 weeks, there was a reduction in the restriction of participation in daily activities both in the emotional and social/situational scales of the Hearing Handicap Inventory for the Elderly. Elderly individuals with moderately severe loss reported higher hearing handicap at the social subscale and the global score. The Mini Mental State Examination analysis revealed higher scores for the Orientation to Time and Place, Repetition/Registration, Attention and Calculation, Recall, and Language domains at the post-fitting evaluation. Regarding gender, females presented lower mean scores in Attention and Calculation. **Conclusion:** Elderly individuals were benefited by the use of hearing aids, which reduced self-perception of hearing handicap and improved cognition aspects of Orientation to Time and Place, Repetition/Registration, Attention and Calculation, Recall, and Language.

Keywords: Hearing aids; Hearing loss; Cognition; Aged; Surveys and questionnaires

RESUMO

Introdução: A deficiência auditiva pode exacerbar mudanças cognitivas decorrentes do envelhecimento. **Objetivo:** Estudar a restrição de participação em atividades diárias e processos cognitivos em idosos, novos usuários de próteses auditivas. **Métodos:** Foram avaliados 50 idosos com perda auditiva neurossensorial de grau leve a moderadamente severo, novos usuários de amplificação sonora, distribuídos em três grupos, segundo o grau da perda auditiva. Foram aplicados o *Hearing Handicap Inventory For Elderly* e o Mini Exame do Estado Mental, antes e após 12 a 16 semanas de uso das próteses auditivas. O tratamento estatístico foi realizado por meio da análise de variância e comparações múltiplas de Bonferroni, com nível de significância de 0,05. **Resultados:** Após a estimulação acústica por meio do uso de próteses auditivas por 12 a 16 semanas, houve redução da restrição de participação em atividades diárias, tanto na subescala emocional, quanto na social/situacional do *Hearing Handicap Inventory For Elderly*. Idosos com perda de grau moderadamente severo apresentaram maiores restrições de participação na subescala social e no escore total do *Hearing Handicap Inventory For Elderly*. O Mini Exame do Estado Mental revelou maiores escores total e dos domínios orientação, memória imediata, atenção e cálculo, evocação e linguagem, após o uso das próteses auditivas. Quanto ao gênero, idosos do gênero feminino apresentaram média dos escores menores em atenção e cálculo. **Conclusão:** Os idosos com deficiência auditiva apresentaram redução da autopercepção das restrições de participação e melhora dos processos cognitivos de orientação, memória imediata, atenção e cálculo, evocação e linguagem, com a estimulação acústica.

Palavras-chave: Auxiliares de audição; Perda auditiva; Cognição; Idoso; Inquéritos e questionários

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INTRODUCTION

Population ageing is now a universal phenomenon seen in both developed and in developing countries. In Brazil, in 2015, elderly population corresponded to 12.5%; it is expected to reach 30% by 2050. The average life expectancy has also increased sharply in the country. By 2025, according to the World Health Organization, Brazil will be the sixth country in the world with the largest elderly population[1].

Due to the increase in life expectancy, there is a growing concern over the quality of life of elderly people[1]. In ageing, a decline in physiological and sensory functions occur, and age-related hearing loss was the third most diagnosed chronic condition in the elderly population in the United States in 1998[2].

The impact of hearing loss in the daily life of individuals can be seen in their social and functional routine. Social isolation and difficulties in professional activities can generate negative emotions, such as anxiety, anger, and sadness, amongst others. To minimize these effects, these individuals should undergo a process of hearing rehabilitation, usually initiated by the fitting of a hearing aid.

Hearing evaluations are not able to detect social, situational and communicative restrictions and limitations caused by hearing loss[3], so the application of self-assessment questionnaires is recommended[4,5,6].

Cognitive decline is also present at ageing[7,8] and it can be worsened by changes in hearing. Therefore, the assessment of cognition in elderly people is of extreme relevance[9].

The hypothesis that guided this study is that acoustic stimulation, through the hearing aid fitting, reduces the limitations and restrictions imposed by hearing impairment and improves cognitive processes by increasing accessibility to speech sounds and less attention (listening effort) requirement for communication.

This study aimed to evaluate the restrictions in everyday activities and cognitive processes in new elderly hearing aids users according to their degree of hearing loss and gender, before and after the fitting of hearing aids.

METHODS

The study was conducted in a clinic accredited by Brazilian Government (Unified Health System) and belonging to *Universidade Federal de São Paulo* in a service of high complexity and previously approved by the Research Ethics Committee of the institution under the number 0945/10. All participants signed the Informed Consent Form.

Fifty elderly patients with symmetrical bilateral sensorineural hearing loss were selected upon the analysis of medical records (examinations and clinical history), none of which had previously used of amplification. They all awaited hearing aids that were to be provided by the Brazilian Government (SUS) at the clinic in which the research was performed. Elderly patients with diagnosis of neurological disorders, severe and profound hearing impairment, as well as pre-lingual hearing loss were excluded from this study. A new audiological evaluation was conducted on the patients at the clinic to update the data. The patients were divided into three groups according to the degree of hearing loss (mild, moderate and moderately severe). The classifications proposed by Silman and Silverman, in 1997[10], and by Lloyd and Kaplan, in 1978[11], were used respectively to classify the patients according to the type and degree of hearing loss. As stated in Brazilian legislation[12], were considered elderly individuals those aged 60 years or more. The protocol developed for this study consisted of a version of the *Hearing Handicap Inventory for the Elderly* (HHIE)[13,14] adapted and translated into Brazilian Portuguese and the Mini Mental State Examination (MMSE)[15,16], which were applied before the fitting of bilateral hearing aids and after 12 to 16 weeks of their effective use.

The HHIE was applied during an interview to assess restrictions in daily life activities. The questionnaire comprised 25 questions: 12 referring to the social/situational subscale to identify situations causing difficulties and determine if the hearing affects the behavior of the individual with hearing loss; and 13 referring to the emotional subscale to assess the attitude and emotional response of the individual with hearing loss. Each question presented three possible answers: "no", "sometimes" and "yes" and a score of zero, two and four was attributed to each of these respectively. At the end, the total score, which could vary from zero to 100, was calculated. The higher the score, the greater the degree of restriction in daily life activities.

MMSE is a cognitive screening test used to evaluate specific cognitive functions. It was applied in elderly patients to measure the processes of Orientation to Time and Place, Repetition/Registration, Attention and Calculation, Recall and Language. Its score ranges from zero to 30 points with thresholds varying according to different degrees of schooling. The most commonly used thresholds are: 13 for illiterate patients, 18 for patients with low schooling (one to four years of formal education) and average schooling (five to eight years of formal education) and 26 for patients with high schooling (over eight years of formal education)[16]. The higher the score on MMSE the better the performance in the test. In this study, the results were not sorted into normal or altered based on the degree of schooling due to the different possibilities of threshold scores for this population. All individuals that took part in the study declared having one to eight years of formal education. Thus, the influence of schooling on the results was minimized, since similar cognitive performance is expected from individuals with the same level of schooling[16].

The patients were evaluated once before the fitting of the hearing aids and again after 12 to 16 weeks of their effective

use. We considered effective use the use of hearing aids for at least eight hours per day.

The analysis of variance with repeated measures was applied to compare the mean scores of the instruments in both evaluations. The assumption of normality was evaluated through the analysis of residues. Bonferroni multiple comparisons were applied to locate the differences between the mean scores indicated in the analysis of variance. A significance level of 0.05 was defined.

RESULTS

The sample consisted of data obtained from the HHIE and MMSE applied on 50 elderly individuals with hearing loss, aged between 60 and 88 years, 24 (48%) of which male and 26 (52%) female, with mean and median age of 71 years and 7 months and 71 years, respectively.

Regarding the degree of hearing loss, 12 (24%) patients presented mild hearing loss, 28 (56%) moderate, and 10 (20%) moderately severe.

The compared analysis of the data from the HHIE emotional subscale before and after the fitting of the hearing aids reveled that mean scores prior to the fitting were higher than those after ($p<0.001$), regardless of gender ($p=0.951$) and degree of hearing loss ($p=0.940$).

As for the social/situational subscale, elderly individuals with moderately severe hearing loss presented higher scores than those with mild loss ($p=0.049$) and moderate loss ($p=0.005$). Results showed no difference between the mean scores obtained from both genders ($p=0.269$), regardless of the degree of hearing loss ($p=0.671$) and of the time of the evaluation, before or after the fitting of the hearing aids ($p=0.742$). The mean scores of after the fitting of the hearing aids were lower than those obtained before it ($p<0.001$) (Table 1).

The analysis of the mean values of the total score of the HHIE showed no difference between genders ($p=0.337$), regardless of the degree of hearing loss ($p=0.600$) and the time of the evaluation, before or after the fitting of the hearing aids ($p=0.768$). The group with moderately severe hearing loss presented higher mean scores than the group with mild loss

Table 1. Mean scores of the Hearing Handicap Inventory for the Elderly by subscale and gender, according to the degree of hearing loss, before and after the fitting of hearing aids

Subscale	Gender	HI degree	n	Mean (before fitting)	Mean (after fitting)	Dif. Means
Emotional	Male	Mild	7	26.3	6.0	20.3
		Moderate	14	30.6	8.6	22.0
		Mod. Severe	3	38.0	20.0	18.0
		Total	24	30.3	9.3	21.0
	Female	Mild	5	28.4	10.0	18.4
		Moderate	14	26.7	7.3	19.4
		Mod. Severe	7	33.4	10.3	23.1
		Total	26	28.9	8.6	20.2
	Total	Mild	12	27.2	7.7	19.5
		Moderate	28	28.6	7.9	20.7
		Mod. Severe	10	34.8	13.2	21.6
		Total	50	29.5	8.9	20.6
Social/Situational	Male	Mild	7	30.0	9.7	20.3
		Moderate	14	31.7	7.4	24.3
		Mod. Severe	3	40.0	18.7	21.3
		Total	24	32.3	9.5	22.8
	Female	Mild	5	28.8	10.8	18.0
		Moderate	14	28.4	7.0	21.4
		Mod. Severe	7	38.9	8.9	30.0
		Total	26	31.3	8.2	23.1
	Total	Mild	12	29.5	10.2	19.3
		Moderate	28	30.1	7.2	22.9
		Mod. Severe	10	39.2	11.8	27.4
		Total	50	31.8	8.8	22.9

Subtitle: HI = Hearing Impairment; n = number of individuals; Dif. Means = difference between mean scores from both evaluations (before and after the fitting of hearing aids); Mod. = Moderately

(p=0.034) and with moderate loss (p=0.014). The mean score from after the fitting of the hearing aids was lower than that from before it (p<0.001) (Table 2).

The analysis of the results obtained from the MMSE revealed that the mean score after the fitting was higher than that obtained prior to it (p=0.005) (Table 3).

The analysis of the results, according to the different cognitive domains assessed through the MMSE, showed that, in regard to Orientation to Time and Place, the mean scores from after the fitting of the hearing aids were higher than those obtained before it (p<0.001) and the mean scores of the group of elderly people with mild hearing loss was higher than those of the group with moderately severe loss (p=0.015).

As for Repetition/Registration, the mean scores obtained after the fitting of the hearing aids were higher than those obtained before it (p=0.005), regardless of gender (p=0.804) and degree of hearing loss (p=0.361).

Concerning the Attention and Calculation domain, the mean scores obtained after the fitting of the hearing aids were higher than those obtained before it (p<0.001). The analysis according to the gender and degree of hearing loss revealed that females presented lower mean scores on Attention and Calculation in comparison to males (p=0.006), prior to the fitting of the hearing aids. The group of elderly females with moderately severe hearing loss presented lower mean scores than the group of females with mild hearing loss (p=0.046). Amongst

Table 2. Mean scores of the Hearing Handicap Inventory for the Elderly – Totals by gender, according to the degree of hearing loss, before and after the fitting of hearing aids

Gender	HI degree	n	Mean (before fitting)	Mean (after fitting)	Dif. Means
Male	Mild	7	56.3	15.7	40.6
	Moderate	14	62.3	16.3	46.0
	Mod. Severe	3	74.7	38.7	36.0
	Total	24	62.1	18.9	43.2
Female	Mild	5	55.2	20.8	34.4
	Moderate	14	55.1	14.3	40.9
	Mod. Severe	7	72.3	19.1	53.1
	Total	26	59.8	16.9	42.9
Total	Mild	12	55.8	17.8	38.0
	Moderate	28	58.7	15.3	43.4
	Mod. Severe	10	73.0	25.0	48.0
	Total	50	60.9	17.8	43.0

Subtitle: HI = Hearing Impairment; n = number of individuals; Dif. Mean = difference between the mean scores of the both assessments (before and after the fitting of hearing aids); Mod. = Moderately

Table 3. Mean scores of the Mini Mental State Examination - Total per gender, according to the degree of hearing loss, before and after the fitting of hearing aids

Gender	HI degree	n	Mean (before fitting)	Mean (after fitting)	Dif. Means
Male	Mild	7	25.3	29.4	4.1
	Moderate	14	21.8	27.4	5.6
	Mod. Severe	3	22.7	26.3	3.6
	Total	24	22.9	27.9	5.0
Female	Mild	5	22.2	28.4	6.2
	Moderate	14	22.2	28.1	5.9
	Mod. Severe	7	18.7	25.9	7.1
	Total	26	21.3	27.5	6.3
Total	Mild	12	24.0	29.0	5.0
	Moderate	28	22.0	27.8	5.8
	Mod. Severe	10	19.9	26.0	6.1
	Total	50	22.1	27.7	5.6

Subtitle: HI = Hearing Impairment; n = number of individuals; Dif. Mean = difference between the mean scores of the both assesments (before and after the fitting of hearing aids); Mod. = Moderately

females, the mean score for after the fitting of the hearing aids was higher than that from before the fitting (p<0.001), which didn't happen with the male group (p=0.062). After the fitting of the hearing aids there was no difference between the mean scores of both genders (p=0.335).

As for Recall, higher mean scores were identified after the fitting of the hearing aids. Considering gender and degree of hearing loss, the mean score after the fitting was higher than before it for elderly male individuals with moderate hearing loss (p<0.001) and female elderly individuals with mild (p<0.001), moderate (p<0.001) and moderately severe (p=0.027) hearing loss. In addition, there was a difference between the mean scores of male and female individuals only in those with mild hearing loss before the fitting of the hearing aids (p=0.006), with the female individuals presenting lower mean scores.

Regarding the Language domain, the mean scores obtained after the fitting of the hearing aids were higher than those obtained before it (p<0.001), regardless of gender (p=0.665) and degree of hearing loss (p=0.218). Patients with moderately severe loss presented lower mean scores than those with mild (p<0.001) and moderate (p<0.001) hearing loss (Table 4 and Table 5).

DISCUSSION

The guidelines of the American Academy of Audiology[17] that guide the process of rehabilitation for adults with hearing impairment present four stages: Assessment; Technical Aspects of Treatment; Guidance, Counseling and Monitoring; and, lastly, Evaluation of Results. The Assessment stage comprises three sub-steps: Auditory Assessment; Assessment of Auditory Needs and Assessment of Non-Auditory Needs. Therefore, the use of instruments to verify auditory and non-auditory (visual, cognitive, psychological problems, amongst others) needs

Table 4. Mean scores of the Mini Mental State Examination - Cognitive domains of Orientation to Time and Place, Repetition/Registration, Attention and Calculation, Recall and Language, by gender, according to the degree of hearing loss, before and after the fitting of hearing aids

Gender	HI degree	n	Orientation to Time and Place		Repetition/ Registration		Attention and Calculation		Recall		Language	
			(before)	(after)	(before)	(after)	(before)	(after)	(before)	(after)	(before)	(after)
Male	Mild	7	8.4	10.0	2.9	3.0	4.4	4.6	2.1	3.0	7.4	8.9
	Moderate	14	7.8	9.6	2.7	3.0	3.1	3.7	1.3	2.9	6.9	8.3
	Mod. Severe	3	7.0	9.7	2.7	3.0	4.0	4.0	2.3	2.7	5.0	7.0
	Total	24	7.9	9.7	2.8	3.0	3.6	4.0	1.7	2.9	6.8	8.3
Female	Mild	5	8.0	10.0	3.0	3.0	3.2	4.0	0.6	3.0	7.4	8.4
	Moderate	14	8.0	9.8	2.8	3.0	2.4	3.5	1.6	2.9	7.4	8.6
	Mod. Severe	7	7.3	9.4	2.6	3.0	1.3	2.7	1.7	2.7	5.9	8.0
	Total	26	7.8	9.7	2.8	3.0	2.2	3.4	1.5	2.9	7.0	8.4
Total	Mild	12	8.3	10.0	2.9	3.0	3.9	4.3	1.5	3.0	7.4	8.7
	Moderate	28	7.9	9.7	2.8	3.0	2.8	3.6	1.5	2.9	7.1	8.5
	Mod. Severe	10	7.2	9.5	2.6	3.0	2.1	3.1	1.9	2.7	5.6	7.7
	Total	50	7.8	9.7	2.8	3.0	2.9	3.7	1.6	2.9	6.9	8.4

Subtitle: HI = Hearing Impairment; n = number of individuals; (before) = before the fitting of the hearing aids; (after) = after the fitting of hearing aids; Mod. = Moderately

Table 5. Comparison of mean scores of the Hearing Handicap Inventory for the Elderly and the Mini Mental State Examination, before and after the fitting of hearing aids

Instrument	Total/Subscale/Domain	n	Before fitting	After fitting	p-values
HHIE	Emotional	50	29.5	8.9	<0.001*
	Social	50	31.8	8.8	<0.001*
	Total	50	60.9	17.8	<0.001*
MMSE	Orientation to Time and Place	50	7.8	9.7	<0.001*
	Repetition/Registration	50	2.8	3	0.005*
	Attention and Calculation	50	2.9	3.7	<0.001*
	Recall	50	1.6	2.9	<0.001*
	Language	50	6.9	8.4	<0.001*
	Total	50	22.1	27.7	<0.001*

*Sgnificant values (p<0.005) - ANOVA test

Subtitle: HHIE = Hearing Handicap Inventory for the Elderly; MMSE = Mini Mental State Examination; n = number of individuals

in patients with hearing impairment, in addition to auditory assessment tools, are of utmost importance. Such evaluation offers support in the choosing of the proper technology, the selecting and adjusting of electroacoustic characteristics, algorithms and resources needed in each case, and helps to measure the effectiveness of the intervention, i.e. the analysis of the results[3,6] and the need for new approaches.

Amongst the tools used to check participation restrictions imposed by hearing impairment (auditory needs) is the HHIE; as for those used to evaluate the cognitive decline (non-auditory needs) the MMSE. Both instruments comprised the evaluation protocol of this study.

The analysis of restriction in participation showed a significant reduction in perception in the individuals assessed after the fitting of the hearing aids. Results showed a reduction in the perception of restrictions in daily life events with the use of hearing aids, thus indicating a benefit provided by amplification. These findings are in agreement with several studies that also found differences between the conditions before and after the fitting of hearing aids[4,5,18,19,20,21,22].

As for the different degrees of hearing loss, although there was no difference in scores regarding the emotional aspect between all three degrees of hearing loss evaluated, for the social aspect, individuals with moderately severe hearing loss reported greater restrictions than individuals with lower degrees of loss. The results of the analysis of total scores were similar. It follows, therefore, that the greater the change in auditory sensitivity, the greater the perception of hearing difficulties and, consequently, the greater the restrictions in daily life. However, this is not a consensus in the literature. Although some authors have found that the greater the hearing loss, the greater the restrictions reported[23], others have found no association between the variables of degree of hearing loss and degree of self-perception of restrictions in daily life[4,19]. The explanation is that the perception of restrictions is directly linked to social demands and communicative performance of the individual, not to the severity of hearing loss.

The fact that individuals with a greater degree of hearing loss reported greater restrictions can be attributed not only to greater hearing impairment, but also to the more likely greater time of sensorial deprivation and, consequently, to more time experiencing hearing difficulties in social situations. Authors related the degree of perception of restrictions to the difficulty in understanding speech in noisy environments, the negative effect, and the level of stress[24]. The results found by these authors and those obtained in this study are complementary if one considers the hypothesis that the greater the hearing loss, the greater the difficulty in understanding speech, especially in acoustically unfavorable environments, like those with too much noise.

The link between the degree of hearing loss and the level of perception of restrictions in daily life is still subject to discussion, but there are no doubts that the use of hearing aids provides benefits, for it favors the reduction of these restrictions.

As far as restrictions in daily life activities are concerned, there were no differences between male and female elderly individuals. The results of the self-assessment of hearing difficulties, carried out through the HHIE, referred to the level of restriction in daily situations of communication caused by hearing impairment reported by the individual. Therefore, the perception is connected to a number of factors, such as severity of impairment, communicative needs, use of auditory assistive devices, like hearing aids, and not directly related to gender.

In view of the fact that hearing impairment can accentuate physiological changes in aging, an evaluation of the mental state of patients that are candidates for sound amplification becomes essential. As for the general assessment, the data obtained in the MMSE revealed higher (better) mean scores after the fitting of the hearing aids, in comparison to those obtained before it. A similar result was described in another study[25]. Although it was possible to detect a decrease in the mean scores along with the increase of degree of hearing loss, after statistical analysis there were no differences in such mean scores when compared amongst themselves, both before and after the fitting of the hearing aids.

Some authors have evidenced differences in the MMSE scores in relation to the degree of hearing loss, with worse scores for individuals with severe to profound hearing loss in comparison to those with mild and moderate loss[26].

Regarding the Orientation to Time and Place and Language domains, results were similar: elderly individuals with mild hearing loss presented better performance in comparison to individuals with moderately severe loss. With respect to the Language domain, elderly individuals with mild hearing loss presented better performance in comparison to individuals with moderate loss. In both domains, the performance was better after the fitting of hearing aids in comparison with what was observed before it; the same was observed for the Repetition/ Registration domain.

For the cognitive dimensions of Attention and Calculation and Recall, the mean scores after the fitting of the hearing aids was higher than those obtained before the fitting in all three degrees of hearing loss, thus indicating an improvement in test performance after effectively wearing the device for 12 to 16 weeks.

Concerning the performance on the MMSE, considering the total score, there were no differences related to the gender variables. There were some differences in the separate analysis of the cognitive processes: in the Attention and Calculation domain, female individuals with moderately severe hearing loss presented the worst performance; in Recall, female individuals with mild hearing loss presented worse performance prior to the fitting of the hearing aids.

Although the performance on the MMSE test is influenced by the degree of schooling, in this study, MMSE absolute

values were analyzed without being classified as normal or altered. This was because one of the purposes of the study was to describe the cognitive performance of hearing impaired individuals before and after the use of amplification and, also, because the thresholds for what is considered normal and altered according to each degree of schooling varies from study to study, since, in Brazil, there is a great diversity of schooling amongst populations from different regions[16,27,28,29]. However, as previously mentioned, all participants in the study reported having one to eight years of formal education, which minimized the influence of schooling on cognitive performance[16].

An acoustic signal of poor quality requires the use of more attentional and cognitive resources to comprehend speech. When a greater effort in hearing is required, there is also a greater demand of cognitive processes, compromising, therefore, the processing of sound information and, consequently, communication. The performance improvement on the MMSE evaluation upon the use of hearing aids, evidenced by the data obtained in this study, may derive from an improvement on the access to the speech signal and how it is better used after the period of acclimatization, considering there was an improvement in the processing of sound information through the auditory pathway[30]. Consequently, fewer cognitive resources were necessary to understand speech, thus making the communicative process more efficient.

Lastly, here are some important considerations on the process of adaptation to the use of hearing aids regarding the instruments selected for this study: a) the instruments used are easily and quickly applied, do not require extensive technological and financial resources and allow the extraction of important information, which helps the clinician in charge of the hearing rehabilitation make decisions and analyze the results; b) HHIE is extremely well known and widely used by audiology professionals, however, the same is not true with respect to the MMSE; c) the investigation of cognitive processes is fundamental in the assessment of patients with hearing impairment, once there is knowledge of the top-down processes in hearing and communication. The MMSE cognitive screening instrument can be applied by health professionals from different areas. Therefore, the use of this instrument in clinical practice is recommended.

As advocated in the guidelines of the American Academy of Audiology[17] for the rehabilitation of hearing impaired adults, an assessment should be made on the hearing, auditory and non-auditory (in which cognitive processes are included) needs of patients starting the hearing rehabilitation process because these data will guide the professional in charge of the rehabilitation.

CONCLUSION

Elderly individuals with hearing impairment presented a reduction in self-perceived restrictions in daily activities with acoustical stimulation by means of hearing aids, both in emotional and social aspects. There was no correlation between gender and daily life restrictions.

Elderly individuals with moderately severe hearing loss presented greater self-perception of restrictions in daily life activities, determined by situational and social aspects, as well as worse performance on tasks that involved the cognitive processes of Orientation to Time and Place, Attention and Calculation, and Language, when compared to elderly individuals with less severe hearing loss.

The fitting of hearing aids promoted an improvement in the cognitive processes of Orientation to Time and Place, Repetition/Registration, Attention and Calculation, Recall and Language.

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