HEARING AIDS DISPENSED BY SUS AND QUALITY OF LIFE

Próteses auditivas dispensadas pelo sus e qualidade de vida

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ABSTRACT

Purpose: to verify the effectiveness of the use of hearing aids dispensed by SUS in a high complexity service in the city of São Paulo and evaluate their impact on adults and elderly quality of life. **Methods:** this research has been approved by the Ethics and Research committee. We evaluated 30 adults and 30 older adults with bilateral sensorineural hearing loss whose level is from mild to moderately severe, percentage of speech recognition minimum of 52%, who received hearing aids for more than one year and had no other commitments. Were applied: International Outcome Inventory for Hearing Aids (IOI-HA) and *Outcomex Study 36 – Item Short Form Health Survey – SF 36*. **Results:** 63,33 % of the elderly and 73,34 % of adults showed 25 or more IOI-HA score . About the 60 patients, 18% did not use hearing aids, 3.3% used between 1 and 4 hours per day, 25.% used between 4 and 8 hours and 53% used more than 8 hours. The elderly who use hearing aids presented better scores on social aspects and mental health. **Conclusion:** 60% of adults and 46% of elderly use hearing aids and present satisfactory quality of life.

KEYWORDS: Hearing Aids; Quality of Life; Unified Health System

INTRODUCTION

Among sensorial privations, hearing impairment is the one that causes the most impact in the communication process, limiting the activities and restricting the action of the hearing impaired person in daily situations. In the demographic census made in 2000, it was found that hearing impairment is the third major disability in Brazil, just behind visual and motor disabilities [1].

Hearing impairment leads to difficulty in comprehending speeches, harming the physical and mental integrity of the hearing impaired, alienating him from family and social interaction. Therefore, the hearing impairment affects not only the hearing sensitivity, but also results in severe psychosocial implications[2].

When there is no clinical or surgical treatment for the hearing impairment, the resource is the adaptation of hearing aids. The decision of using hearing aids is not due only to the level of hearing loss, but rather to the level of commitment experienced by the hearing impaired in his daily life activities.

It is known that sound amplification systems have been improved and refined, always in order to provide better communication quality to the person with hearing impairment.

During the process of selection, adaptation, examination and validation of the individual hearing aid set (IHAS), it is fundamental that the audiologist is aware to the patient's performance in this new condition and instructs him about the real benefits of the hearing aids[3].

In almost all hearing loss cases, there is a way of substantially improving the subject's quality of life using the hearing aids adaptation.

The evaluation of a subject's heath is directly related to his life quality and can be influenced by sex, schooling, age, economic condition and presence of impairments. This way, assessing life and health conditions permits the implementation of intervention proposals, both specific programs and in general social policies, in order to promote the welfare of individuals[4].

The expression "welfare" has a very comprehensive concept that embraces since a popular

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concept, largely used nowadays, in relation to feelings and emotions, personal relationships, health systems, social support activities, up to the scientific perspective, with many meanings in the health area. When used in the healthcare environment, the term welfare is generally associated to meanings like health condition and social functioning. Welfare related to health and the patient's subjective health state are concepts related to a subjective evaluation. Moreover, one must investigate the impact that the welfare of a subject causes in his daily activities. The World Health Organization (WHO) proposes a concept for subject and multidimensional quality of life as " individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." It is a broad concept and embraces from body health, the psychological state, the level of independence, the social relations up to the personal beliefs. Accordingly, the quality of life reflects the perception that the subject has of one's needs and if these are being fulfilled and the opportunity of achieving happiness and self-realization[5].

Hearing impairment is a health problem that affects the communication of a subject and, therefore, one's quality of life. Therefore, from the foregoing, the goal of this study was to verify the effectiveness of the usage of hearing aids given by SUS in a high complexity service in the city of São Paulo and evaluate its impact in the quality of life of adults and elderly.

METHODS

According to the Standards established for researches using human beings, the present work was approved by the Ethics Committee of the São Paulo Federal University (Universidade Federal de São Paulo - UNIFESP), under the number 0114/10.

For this study, were selected all the patients who received the hearing aids from SUS, in the Integrated Care, Research and Education in Hearing Center (ICREHC) in the Phonoaudiology Department of UNIFESP between July, 2008 and July, 2009. When this period is considered, it is verified that 1,008 patients received their hearing aids, 722 of them received from July to December, 2008. Concerning the patients aged between 18 and 59, 249 adults received their prostheses in the second semester of 2008 and 75 in the first semester of 2009. As to the elderly, 340 received in the second semester, from July to December, 2008 and 147 from January to July, 2009. It was necessary the inquiry of two different periods because the number of adapted elderly is significantly larger than the adults'. This way, for the selection of the elderly participants it was only necessary to consider the relation of the patients adapted in the first semester of 2008, while concerning the adult participants was indispensable the use of the relation of the adapted patients within a year time (from July, 2008 to July, 2009). Once related, these patients were invited to take part of the research, respecting the order they have received their hearing aids until two groups with 30 patients each were completed.

The eligibility criteria for the composition of the sample were: bilateral symmetrical sensorineural hearing loss of up to moderately severe[6], percentage index of speech recognition (SRI) of 52% or more and not present evidence of other impairments.

Thus, were evaluated 30 adults, aged 19 to 59 years, with an average of 43.7 years of which 16 (sixteen) were female and 14 (fourteen) male and 30 elderly aged 62 to 87 years, with an average of 75 years, of these 13 (thirteen) were male and 17 (seventeen) female.

Survey questionnaires used were International Personal Sound Amplification Device (IOI-HA) and Medical Outcomex Study 36 - Item Short Form Health Survey - SF 36.

The IOI-HA was translated into Portuguese and named Questionário Internacional para Aparelho de Amplificação Sonora Individual (QI-AASI) which is an international instrument for the evaluation of individual hearing aids (IOI - HA - International Outcome Inventory for Hearing Aids). The questionnaire consists of seven questions that assess subjectively the result of adaptation of the electronic device of amplification under the following aspects: 1 - Use; 2 - Benefit; 3 - Residual activity limitation; 4 - Satisfaction; 5 - Restriction residual participation; 6 - Impact on others; 7 - Quality of life. The IOI-HA scores vary from 7 points, which indicates the worst performance of the patient, to a maximum of 35 (thirty five) points, which corresponds to the best performance with adaptation[7].

The questionnaire of quality of life, SF-36 (Medical Outcomex Study 36 - Item Short Form Health Survey - SF 36) was elaborated by Ware in 1992 [8] and translated and adapted for the Brazilian population by Ciconelli et al in 1999 [9]. This is an instrument used in the assessment of quality of patient's life. It consists of 11 questions and 36 items covering eight distinct aspects, represented by: functional capacity (FC), physical (AF), emotional (AE), pain intensity (D), general health (EGS), vitality (V), social aspects (AS) and mental health (SM). The items are evaluated, and the individual receives a score for each aspect, which is transformed into a scale of 0 to 100 in which zero is considered the worst score and 100 at the best score.

Were performed descriptive and inferential analysis. In inferential analysis, in order to determine the association between hours of use and each of the domains of the SF-36, in both groups (adults and elderly), was applied the Kruskal-Wallis[10]. On the location of the differences between the categories of hours of use, was applied Bonferroni method (Fisher and van Belle, 1993). Significance level of 0.05.

RESULTS

The study was conducted on two groups of users of hearing aids, one composed of 30 adults, aged between 19 and 59 years, and the other by 30 individuals, aged between 62 and 87 years.

It was found that 16 (53.3%) of adults were female and 14 (46.7%) were male. In the elderly group, 17 (56.7%) were female and 13 (43.3%) were male. Thus, there was a predominance of females in the two sample groups.

Results are presented by sample group.

- Adult Group:

Was initially performed the analysis of the total score obtained from the questionnaire IOI-HA.

The scores of the IOI-HA questionnaire for adults are shown in Figure 1.

The most frequent scores were 25 (twenty-five) and 34 (thirty-four). A score of 25 points or more was achieved by 73.34% of the population indicating good performance with hearing aids.

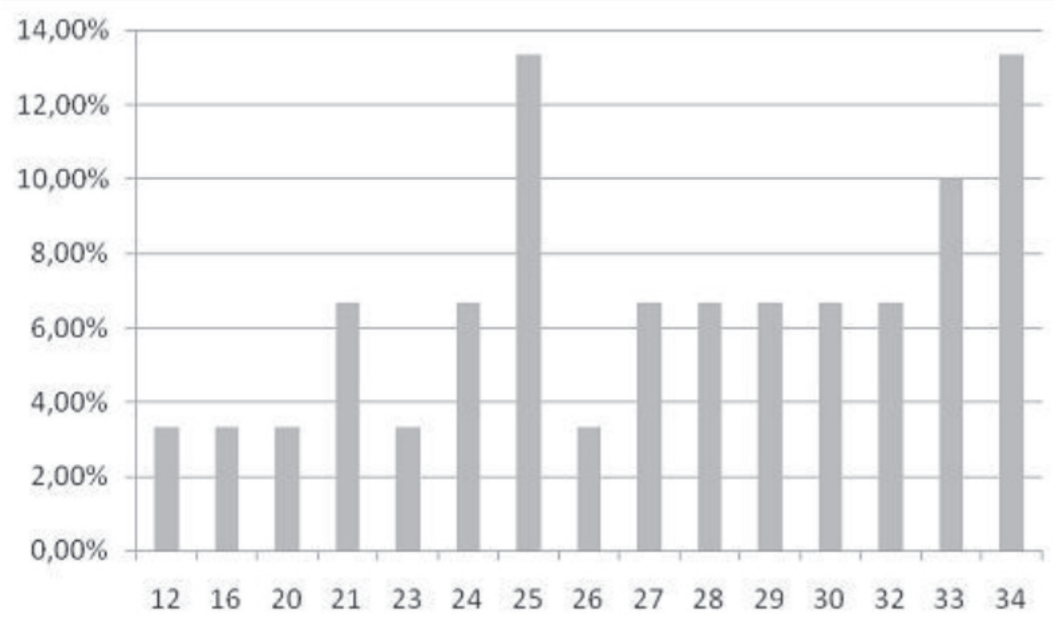


Figure 1 – Percentage distribution of scores obtained by adults on the questionnaire IOI-HA

Table 1 – Frequency distributions and percentages of hours of use in the Adult group

Group	Hours of use								Total	
	did not use		1-4		4-8		more than 8			
	N	%	N	%	N	%	N	%	N	%
Adults	4	13.30%	1	3.30%	7	23.30%	18	60.00%	30	100.00%

Answers to the questionnaire IQ-AAS.

The data of Table 1 show that the majority of adults (60%) use the device more than 8 hours a day. From these data, the association between hours of use of hearing aids (IOI-HA) and quality of life (SF-36) was made.

The values of descriptive statistical analysis of the adult group and the percentage for the eight SF-36 domains are presented in Table 3. The analysis was made for each SF-36 domain separately and linked to the duration of use of hearing aids.

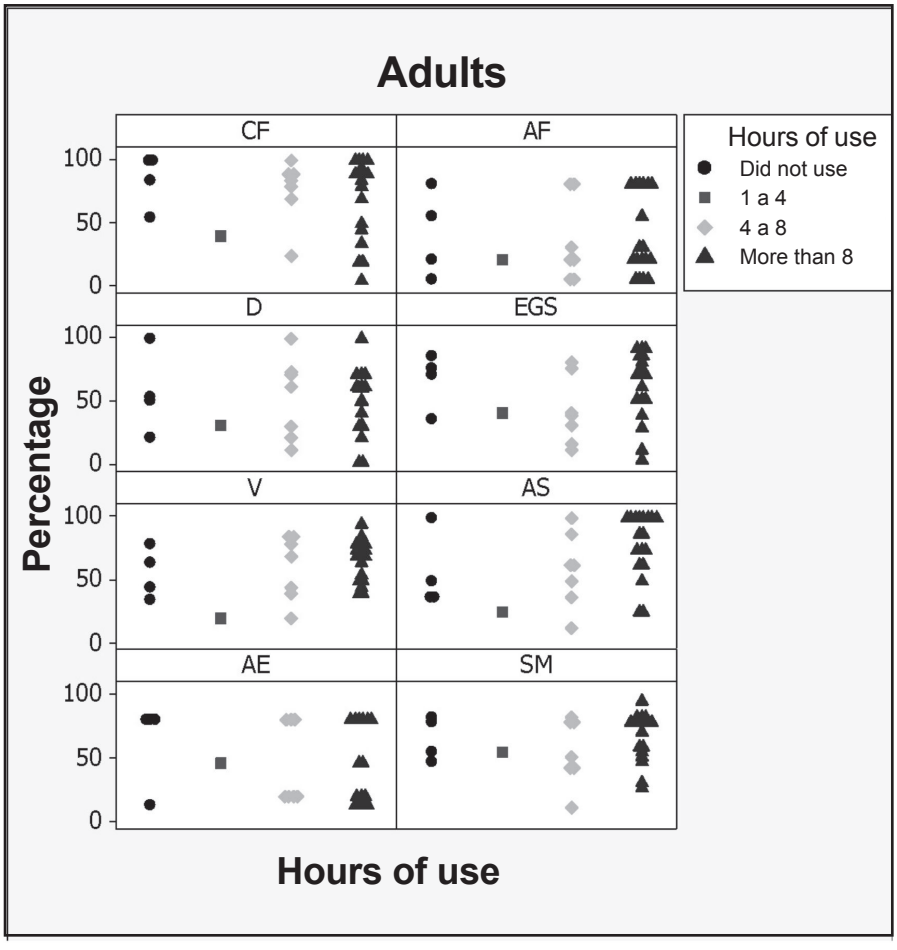
Table 2 – Hours of use related to the eight SF-36 domains

Hours of use	Adult									
	N	%	CF	AF	D	EGS	V	AS	AE	SM
Não usa	4	13.3%	83.5	40.0	55.6	67.0	55.0	55.0	63.3	65.8
1 a 4	1	3.3%	38.5	20.0	30.8	40.8	18.8	23.8	46.6	54.8
4 a 8	7	23.3%	75.6	34.3	52.1	41.9	59.5	57.7	45.7	55.4
mais de 8	18	60.0%	68.8	39.7	48.1	61.5	65.5	77.9	44.1	67.5
Total	30	100%	71.3	37.8	49.5	57.0	61.1	68.3	47.1	64.0

Averages per category SF-36.
CF: Functional Capacity, AF: Functional Aspect, D: Pain; EGS: General Health; V: Vitality, AS: Social Aspect; AE: Emotional Aspect, SM: Mental Health.

There were no trends of increase or decrease in the average scores of the SF-36 domain by increasing the hours of use per day.

The individual values observed in each domain by category of hours of use are shown in Figure 2.



Kruskal-Wallis test. P-values> 0.1
CF: Functional Capacity, AF: Functional Aspect, D: Pain; EGS: General Health; V: Vitality, AS: Social Aspect; AE: Emotional Aspect, SM: Mental Health.

Figure 2 – Individual values of the percentage in each domain of SF36 by category usage hours - adult group

To compare the distributions of percentage in the categories of hours of use the Kruskal-Wallis test[10] was applied.

As there is only one individual in the category "1-4 hours," the analysis was conducted in two ways:

A) Considering the four categories of hours of use originally proposed, and

B) Adding the categories "not used" and "1-4 hours".

This way, were obtained three categories of hours of use.

The p-values obtained from the two analyzes in each domain are presented in Table 3.

Table 3 – P-values obtained in the comparison of distributions of Percentage in 4 categories of Hours of use in each domain of SF-36 – Adult Group

N. of categories	Domain							
	CF	AF	D	EGS	V	AS	AE	SM
4	0.560	0.956	0.918	0.370	0.306	0.117	0.783	0.623
3	0.933	0.915	0.916	0.275	0.296	0.079	0.643	0.444

Kruskal-Wallis test. P-values> 0.1 (except AS with 3 categories).
CF: Functional Capacity, AF: Functional Aspect, D: Pain; EGS: General Health; V: Vitality, AS: Social Aspect; AE: Emotional Aspect, SM: Mental Health.

One can see that there is no significant difference between the percentage distributions of the categories of hours of use in all areas, both in the analysis of four categories, and in the analysis with three categories of hours of use. Therefore, one can conclude that in the adult group there is no association between duration of use of the device and the quality of life.

- Elderly Group:

The scores of the IOI-HA applied in Elderly Group, which results are presented by frequency of occurrence (in percentage) are shown in Figure 3.

The results showed that the most frequent scores in the Elderly Group were 28 (twenty-eight) and 30 (thirty) points. A score of 25 or more was achieved by 63.33% of the elderly which indicates good performance with hearing aids.

The data of Table 4 show that 46.7% of the elderly use the device more than 8 hours a day. From these data, was made the association between hours of use of hearing aids (IOI-HA) and quality of life (SF-36) which is assessed separately in each domain.

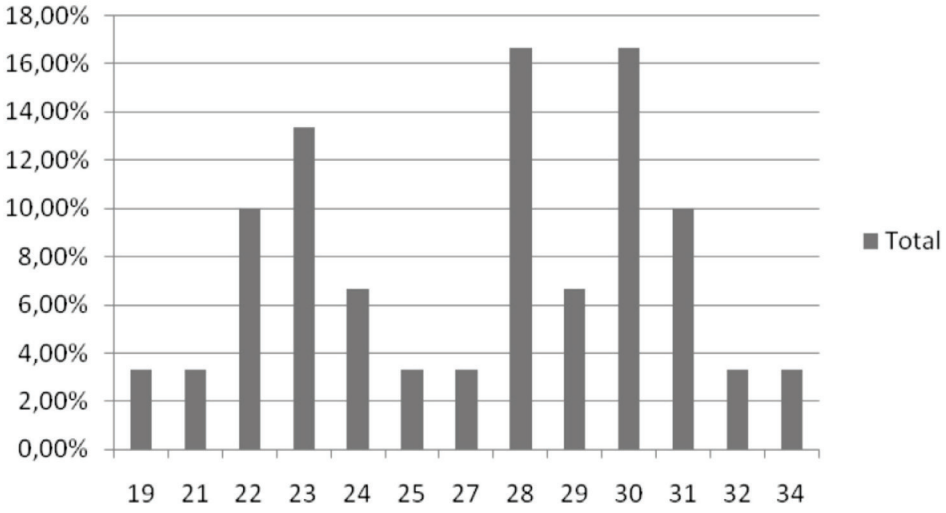


Figure 3 – Percentage Distribution of scores obtained by elderly in the questionnaire IOI-HÁ

Table 4 – Frequency distributions and percentages of hours of use in the Elderly Group

Group	Hours of use								Total	
	Did not use		1-4		4-8		More than 8			
	N	%	N	%	N	%	N	%	N	%
Elderly	7	23.30%	1	3.30%	8	26.70%	14	46.70%	30	100.00%

Answers to the questionnaire IOI-HA.

The average scores of the eight domains of the SF 36 by category of hours of use for the elderly group are found in Table 5.

It can be observed that in areas Emotional Appearance (AE) and Mental Health (MH) - Table 5, the average percentages observed in the categories "between 4 and 8" and "more than 8" are higher when compared to other categories. The individual values of the percentage in each area are shown in Figure 4.

Table 5 – Hours of use related to the eight SF-36 domains in the Elderly Group

			Elderly							
Hours of use	N	%	CF	AF	D	EGS	V	AS	AE	SM
Did not use	7	23.3%	56.1	25.7	39.7	61.9	65.9	66.6	40.0	53.7
1-4	1	3.3%	93.5	55.0	70.8	90.8	88.8	11.3	46.6	50.8
4-8	8	26.7%	65.4	44.4	53.7	60.0	65.1	62.8	60.0	62.8
More than 8	14	46.7%	76.4	32.5	66.6	70.1	66.4	72.0	59.5	79.9
Total	30	100%	69.3	34.8	57.0	66.2	66.7	66.3	54.7	68.3

Averages per category SF-36.
CF: Functional Capacity, AF: Functional Aspect, D: Pain; EGS: General Health; V: Vitality, AS: Social Aspect; AE: Emotional Aspect, SM: Mental Health.

Kruskal-Wallis test. P-values> 0.1 (except SM).
CF: Functional Capacity, AF: Functional Aspect, D: Pain; EGS: General Health; V: Vitality, AS: Social Aspect; AE: Emotional Aspect, SM: Mental Health.

Figure 4 – Percentage of individual values in each domain of SF36 per category of hours of use - Elderly Group

To evaluate the association between hours of use and each of the SF-36 domains in the elderly group, the Kruskal-Wallis test was used. Were also made two analyzes, one considering the four original categories of hours of use and other aggregating the first two categories. The p-values obtained from the two analyzes are found in Table 6. One can notice that only in the SM domain the percentage distributions are not all the same in the categories of hours of use.

To find in which categories there is a difference between the distributions of the percentage, the analysis was continued, and the categories were compared in pairs. For this, were considered hours of use divided in three categories: not used/between 1 and 4 hours; between 4 and 8 hours; and more than 8 hours. The Bonferroni procedure was applied in the calculation of p-values.

With these analyzes, it was found that there was no significant difference between the percentage distributions in the “not used/between 1 and 4 hours” and “between 4 and 8 hours” (p> 0.999); the percentages in the category “more than 8 hours” tend to be larger than in the category “not used/between 1 and 4 hours” (p = 0.017) and no differences were observed between the percentage distributions in the “4 to 8 hours” and “more than 8 hours” (p = 0.229).

These results show that there is an association between daily use of the device and the quality of life in the Mental Health field. Individuals who use the devices more than 8 hours daily tend to have higher scores (better quality of life) regarding mental health. However, there is no association between the use of the device and the quality of life.

Table 6. P-values obtained from the comparison of the percentage distributions in 4 categories of hours of use in each domain of the SF-36-Elderly Group

n. of categories	Domain							
	CF	AF	D	EGS	V	AS	AE	SM
4	0.155	0.565	0.119	0.464	0.609	0.476	0.412	0.039
3	0.255	0.611	0.110	0.668	0.928	0.659	0.239	0.015

Kruskal-Wallis test. P-values> 0.1 (except SM).
CF: Functional Capacity, AF: Functional Aspect, D: Pain; EGS: General Health; V: Vitality, AS: Social Aspect; AE: Emotional Aspect, SM: Mental Health.

DISCUSSION

The sample was composed of 60 individuals, 30 adults and 30 elderly. It was found that 16 (53.3%) of adults were female and 14 (46.7%) were male. In the Elderly Group, 17 (56.7%) were female and 13 (43.3%) were male. Thus, there was a predominance of females in the two sample groups.

The results showed that the most frequent scores obtained in the IOI-HA by the Elderly Group, 28 and 30 points, were achieved by 33.3% of this group. In the adult group, scores frequently were 25 (twenty-five) and 34 (thirty-four) points, achieved by 26.6% of the sample. It was also found that 76% of adults and 71% of the elderly had a score higher than 25 points which indicates good performance with hearing aids.

According to Freitas and Costa (2007)[11], the self-evaluation questionnaires are effective tools to measure the difficulties caused by hearing impairment. Some of these difficulties can be identified by assessing the self- perception of hearing impaired about their communication needs, allowing the establishment of targets for treatment. One can monitor and evaluate these difficulties during the adaptation process of hearing aids. Authors describe the restriction on participation in daily life activities imposed by hearing impairment to the elderly as something that affects the social and professional performance, and consequently their quality of life as well. In a study conducted in 2004, the authors found that there was a significant decrease in the hearing difficulties after the effective use of the hearing prosthesis for six months[12].

This survey revealed that 60% of adults use the devices more than 8 hours per day, 23.3% use between 4 and 8 hours and 13.3% do not use at all. In the Elderly Group, 46.7% used the devices more than 8 hours per day, 26.7% between 4 and 8 hours and 23.4 did not use them. Moreover, only one individual in each group used the hearing aids 1 to 4 hours a day.

Adults make more effective use of hearing aids. This fact can be explained by the inclusion of those in the labor market and therefore they are more demanded in their daily activities.

According to previous researches in the area, individuals have significant reduction of self perception regarding participation restrictions after one year of use of hearing aids, being that this reduction is regardless of gender and age. This improvement is attributed to adaptation and effective use of the hearing aids[13], which corroborates the findings of the present research which showed that adults and the elderly make effective use of hearing aids and perform well with them.

The self-assessment questionnaires investigate self-perception of functional and psychosocial losses caused by hearing loss in subjects' lives. Subjective evaluation of the benefits of amplification with self-assessment questionnaires is considered important and assists in the selection and validation of the results of adaptation[14].

Magalhães and Iório (2011)[13] concluded that there is less perception of participation restrictions after speech therapy and in relation to cognitive processes, the elderly have improved after speech therapy, regardless of gender and age.

It can be seen that, in the Elderly Group, Emotional Appearance (AE) and Mental Health (MH) fields, the averages of the percentages observed in the categories "between 4 and 8" and "more than 8" are higher when compared to other categories. These results show that there is an association between daily use of the device and the quality of life in these areas. In the Adult Group, it was noticeable that there was no significant difference between the percentage distributions in the categories of hours of use in all areas. Therefore, there is a difference in the elderly group in such a way that the higher the use of prostheses, the better is the emotional and mental health, while no differences were observed in the group of adults.

The results of the present research suggest that an adequate adaptation of hearing aids, which

comprehends since guidance and programming made up to the effective use of such by the patient, is capable of generating auditory benefits, minimizing the difficulties caused by the hearing loss[11]. The same has been cited by other authors[12], who suggested that the professionals working in the field of Audiology must know the difficulties of each patient. During the process of adaptation of hearing aids, these difficulties can be measured so that the self-evaluation questionnaires are quite effective. The study conducted by the authors revealed that hearing difficulties significantly decreased after the effective use of hearing aids for six months.

The process of adapting the hearing prosthesis is essential for the individual to develop their potential in their daily life, according to the study[14].

In November 2000, the Health Ministry, through the Department of Health Care, published Ordinance 432[15] which guaranteed the Brazilian citizen with hearing loss the assessment, diagnosis of the loss, his or her fitting and monitoring. In September 2004, the Health Ministry issued the Ordinance GM 2073 (Brazil, 2004), which established the National Policy for Hearing Health Care and the Ordinance 589 (Brazil 2004-b), this one replacing the Ordinance 432 and changing the form of the provided service. The ordinance 2073/GM/04 (Brazil, 2004) establishes nationwide policies for the hearing health of the population. In Article 2, it expresses the importance of reference centers in the development of strategies that aim to promote the quality of life of persons with regard to the restoration of health and prevention of damage, protecting and enhancing the autonomy and equality of individuals and community.

CONCLUSION

In the elderly group:

- 46.7% makes effective use of the hearing aids.
- There is an association between daily use of the device and the quality of life in the domain of Mental Health and Emotional Aspect.

In the adult group:

- 60% makes effective use of the hearing aids.
- No association between daily use of the device and the quality of life.

RESUMO

Objetivo: verificar a efetividade do uso de próteses auditivas dispensadas pelo SUS em um serviço de alta complexidade da cidade de São Paulo e avaliar o seu impacto na qualidade de vida de adultos e idosos. **Métodos:** pesquisa aprovada pelo Comitê de Ética e Pesquisa. Avaliaram-se 30 adultos e 30 idosos com perda auditiva neurossensorial bilateral de grau leve a moderadamente severo, índice percentual de reconhecimento de fala de no mínimo 52%, que receberam as próteses auditivas há mais de um ano, sem outros comprometimentos. Aplicaram-se: Questionário Internacional de Resultados para Aparelhos de Amplificação Sonora (QI-AASI) e o Inventário de Qualidade de Vida (SF36). **Resultados**: o estudo do escore total do QI_AASI revelou que 63,33 % dos idosos e 73,34 % dos adultos apresentaram escore igual ou maior do que 25 pontos o que indica bom desempenho com as próteses auditivas. Dos 60 pacientes avaliados, 18% não utilizavam as próteses auditivas, 3,3% utilizavam entre 1 e 4 horas diárias, 25,0% entre 4 e 8 horas e 53% mais que 8 horas. Os idosos que usam as próteses apresentam melhores escores no aspecto social e saúde mental. **Conclusão:** 60% dos adultos e 46% dos idosos fazem uso efetivo das próteses auditivas e apresentam qualidade de vida satisfatória.

DESCRITORES: Auxiliares de Audição; Qualidade de Vida; Sistema Único de Saúde

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