THE USE OF SELF-ASSESSMENT QUESTIONNAIRES FOR VALIDATION OF THE RESULTS IN HEARING AID SELECTION AND FITTING PROCESS

O uso de questionário de autoavaliaçâo na validação dos resultados do processo de seleção e adaptação de dispositivos eletrônicos de amplificação sonora individual

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ABSTRACT

Purpose: verify the effect of the use of hearing aid in hearing impaired subjects through a self-assessment questionnaire. **Methods:** the questionnaire International Outcome Inventory for Hearing Aids was used to validate the results. 22 hearing aid users, aged 32 and 85 years, with bilateral sensorineural hearing loss from mild to severe, post-lingual, were evaluated. All participants were users of amplification with unilateral or bilateral adaptation for at least 12 weeks. **Results:** the mean total score obtained in the application of the questionnaire was 27 and there was no significant difference (p = 0.191) between scores on the seven questions in the questionnaire, being the average of 3.85 points. There was no correlation of results either with the patients' age or with time of amplification. There was no significant difference in the total score of the questionnaire as well as factors 1 and 2 when considered: degree of hearing loss, audiometric configuration, hearing aid model and unilateral or bilateral adaptation. **Conclusion:** through the application of the questionnaire it was found that the use of sound amplification has beneficial effects for their users and that they were satisfied with their use.

KEYWORDS: Patient Satisfaction; Quality of Life; Hearing Aids; Questionnaires

INTRODUCTION

According to the data from 2010 Census[1], 9.8 million Brazilian people declared to present hearing impairment (HI). Probably, this number is much higher, as the World's Health Organization declares[2] more than 15 million Brazilian people have hearing problems, because often the problem is not realized or it is denied by subjects. Frequently, not accept hearing difficulties, causes an absence of treatment that can intensify the frustration in not hearing and leads the subject to isolation.

Regardless the degree of hearing loss, any subject who reports hearing and communication difficulties should be considered as a potential candidate to use hearing aids[3].

The Hearing Aid – HA has the function of amplify sounds in a way that allows the subject to use their reminiscent hearing in an effective way[3].

Selection and fitting process of the HA should aim the decrease of activity limitations and participation restrictions, the effective use of the prosthesis itself and patient's satisfaction[4]. In 2012, a study developed with elderly carriers of sensorineural hearing loss reported an improvement on life quality, more body balance and less preoccupation on falling, tinnitus decrease and self-confidence increase after the hearing aid fitting[5].

Among several questionnaires available for area professionals, the International Outcome Inventory for Hearing Aids (IOI-HA) is often used

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in national[6,7] and international[8] researches for subjects' self-assessment, regarding amplification.

This material was designed with questions of low cognitive demands and an ease reading level for subjects, aiming to improve the cooperation between researchers and professionals of rehabilitation programs in many hearing health services[9]. The questionnaire (IOI-HA) aims to document from the subjects' point of view the evolution of daily use the prosthesis, considering not only the satisfaction level, but also the limitations on basic activities, participation restrictions, impact on others and life quality[10,11]. By applying the questionnaire IOI-HA is possible to document the evolution of the hearing aid use considering its use in daily routine, its benefits and subjects' satisfaction level. As well as being possible to observe improvement on more limited activities, as noisier places, and mainly the decrease of the impact that the impairment may cause on others, consequently an improvement on life quality[12].

The present study aimed to verify the effect of hearing aid use on patients through a self-assessment questionnaire.

METHODS

This research was approved by the Committee of Ethics in Research under protocol nº 04/2011. Users among three to 60 months of using hearing aid, agreed on participate and signed a Consent Form. The collection was made in an audiological office, located in the city of Balneário Camburiú – SC, in which patients received the HA. This sample was chosen because there are few researches with patients of private offices and also it is a convenient sample.

It is a cross-sectional, descriptive, analytic study planned to validate the results of the selection and fitting process of hearing aid electronic devices. It was interviewed 22 HA users, among 32 and 85 years old, carriers of sensorineural bilateral post-lingual hearing loss of mild to severe degree. All participants were hearing aid users fitted uni or bilateral. The researchers applied as exclusion criteria: less than three months fitting or more than 60 months, other types of hearing loss, patients who developed hearing loss before language acquisition and patients who do not received the hearing aid in the office where the study was performed.

Data collection was made from January to June of 2012 and all the participants were submitted to the application of the questionnaire IOI-HA (International Outcome Inventory for Hearing Aids), proposed by Cox et al in 2000[13]. This material is a product of the Workshop Self-Report Outcome Measures in Audiological Rehabilitation that happened in 2000 and was organized by Cox and collaborators. His proposal was to complement tests that measure aspects involved in adaptation process of hearing aids.

The questionnaire is composed by seven questions of the following aspects: benefits, residual activities limitation, satisfaction, residual participation restriction, impact on others' lives and life quality. Each of the questions has five alternatives, being the patient guided to choose the answer that corresponds to their reality. The score for each question varies from one (worst result) to five (best result), and the higher score (the sum of all items) is of 35 points. According to the analysis criteria of the questionnaire, a high score is indication of a positive evaluation of patient's development with the electronic device use. The gross value is the sum of all answers and the adjusted value is the mean of all answers. The factor 1 is the sum of questions 1,2,4 and 7 and factor 2 is the sum of questions 3,5 and 6, respectively correspondent to subjects' interaction with their own prosthesis, and subjects' interaction with other people in their environment, Figure 1. In the present study, the researcher has read the questionnaire aloud to every participant.

The results were submitted to descriptive and inferential statistical analysis, being used non-parametric tests. The significance level established was of 5% (0.05). All the confidence intervals throughout the study were constructed with 95% of statistic confidence.

International Outcome Inventory for Hearing Aids (IOI-HA)

1. Think about how much you used your present hearing aid(s) over the past two weeks. On an average day, how many hours did you use the hearing aid(s)?

none	less than 1 hour a day	1 to 4 hours a day	4 to 8 hours a day	more than 8 hours a day
☐	☐	☐	☐	☐

2. Think about the situation where you most wanted to hear better, before you got your present hearing aid(s). Over the past two weeks, how much has the hearing aid helped in those situations?

helped not at all	helped slightly	helped moderately	helped quite a lot	helped very much
☐	☐	☐	☐	☐

3. Think again about the situation where you most wanted to hear better. When you use your present hearing aid(s), how much difficulty do you STILL have in that situation?

very much difficulty	quite a lot of difficulty	moderate difficulty	slight difficulty	no difficulty
☐	☐	☐	☐	☐

4. Considering everything, do you think your present hearing aid(s) is worth the trouble?

not at all worth it	slightly worth it	moderately worth it	quite a lot worth it	very much worth it
☐	☐	☐	☐	☐

5. Over the past two weeks, with your present hearing aid(s), how much have your hearing difficulties affected the things you can do?

affected very much	affected quite a lot	affected moderately	affected slightly	affected not at all
☐	☐	☐	☐	☐

6. Over the past two weeks, with your present hearing aid(s), how much do you think other people were bothered by your hearing difficulties?

bothered very much	bothered quite a lot	bothered moderately	bothered slightly	bothered not at all
☐	☐	☐	☐	☐

7. Considering everything, how much has your present hearing aid(s) changed your enjoyment of life?

worse	no change	slightly better	quite a lot better	Very much better
☐	☐	☐	☐	☐

8. How much hearing difficulty do you have when you are not wearing a hearing aid?

severe	moderately -severe	moderate	mild	none
☐	☐	☐	☐	☐

Figure 1 – Self-assessment questionnaire for hearing prosthesis – IOA-HA

RESULTS

It had participated in the study 22 subjects, carriers of sensorineural bilateral hearing loss. Regarding the gender, it was verified that 12 subjects (54.5%) were feminine gender and 10 were masculine gender (45.5%) and this difference was not significant (p= 0.546), according to the Equality for Proportions Test of Two Samples. The mean age was of 70.4 years old ± 14.7. Both feminine and masculine subjects were treated as a single group, since the score was not significant to be treated as two groups. The adjusted total of the feminine gender was of 3.80 and the masculine gender was of 3.91. The factor 1 adjusted of the feminine gender was of 3.75 and the masculine gender of 4.03; the factor 2 adjusted for the feminine gender was of 3.89 and the for de masculine gender of 3.76.

The sample was characterized by the features of the HA fitting and the degree of hearing loss before the presentation of the results collected by applying the questionnaire IOI-HA.

Table 1 indicates there was no difference regarding the degree of hearing loss between ears, according to Davis and Silverman, 1970[14]. The Equality of Proportions Tests for Two Samples also highlighted that for both right and left ears the hearing loss of moderate degree was more prevalent in the sample, being possible to observe statistic difference with normal, moderately severe and severe degrees (Table2).

Table 1- Subjects distribution according to degree of hearing loss for both right and left ear (n= 22)

Degree	RE		LE		p-value
	n	%	n	%	
Normal	2	9.1	0	0.0	0.148
Slight	7	31.8	7	31.8	1.000
Moderate	9	40.9	9	40.9	1.000
Severe	1	4.5	4	18.2	0.154
Mod/Severe	3	13.6	2	9.1	0.635

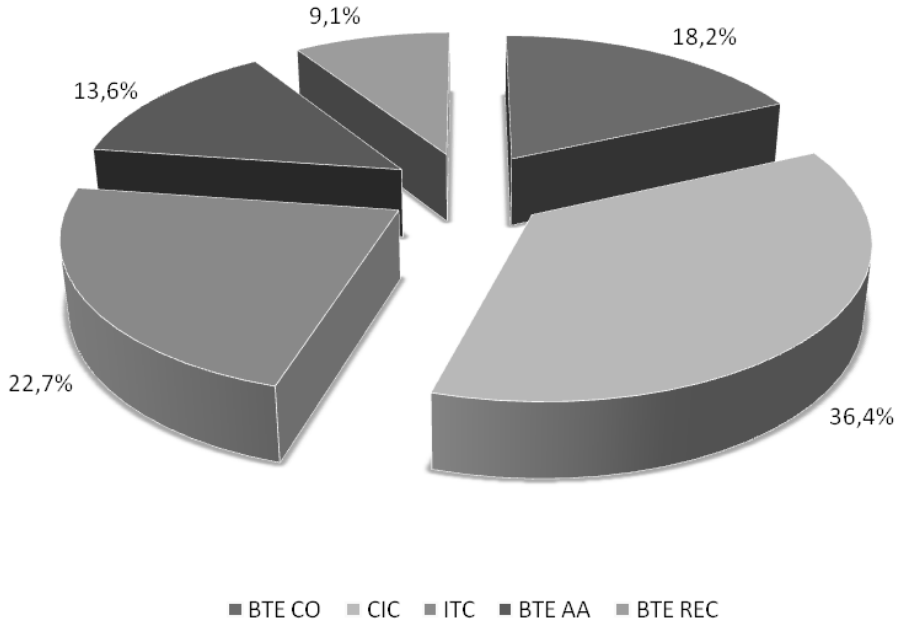
Subtitle: mod/severe (moderately severe)
Two Portions Equality Test

Table 2 – Demonstration of p value relative to the comparison of the degree of hearing loss in each ear

Degree	RE	Le
Normal	0.015	<0,001
Mild	0.531	0.531
Moderate	Ref.	Ref.
Severe	0.004	0.099
Mod/Severe	0.042	0.015

Caption: mod/severe (moderately severe)
Two Portions Equality Test

Regarding the features of HA fitting, the Equality of Proportions Tests for Two Samples presented significant difference (p=0.03) between the type of fitting, being 16 subjects (72.7%) with bilateral fitting and only six (27.3%) with unilateral fitting. Also, the most used HA was completely-in-the-canal (CIC) with 36.4%, and the less used was the receiver-in-the ear (BTE RITE) with 9.1%, however, this was not a significant difference (p=0.228). In Figure 2 is possible to observe the distribution of the HA indicated by type. The behind-the-ear models were divided into conventional behind-the-ear (BTE CO) with 18.2%, and behind-the-ear open fitting (BTE OF) with 13.6% and behind-the-ear receiver-in-the-canal (BTE RITE) with 9.1%. The in-the-canal models were divided into completely-in-the-canal (CIC) with 36.4% and in-the-canal (ITC) with 22.7%.



Caption: BTE CO (conventional behind-the-ear), CIC (completely-in-the-canal), ITC (in-the-canal), BTE AA (behind-the-ear open fitting) e BTE REC (behind-the-ear received-in-canal).

Figure 2 – Distribution of hearing aids according to the adapted model

About the HA adjustment, 15 subjects (68.2%) used programmable devices and seven (31.8%) were users of trimmer adjusted HA, that difference was significant (p=0.016). Eventually, the average time of amplification use was of 23.6 months ± 16.4.

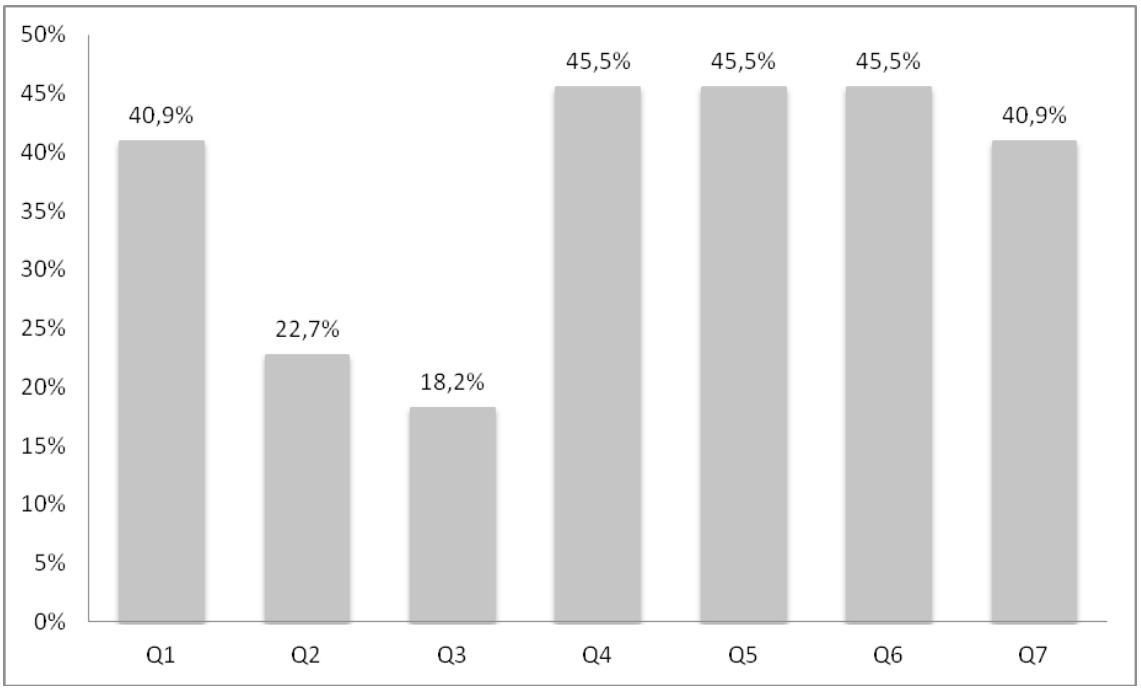
Following, it will be presented the results relative to the questionnaire IOI-HA application.

In Table 3 is presented the mean score obtained in each question of the IOI-HA questionnaire and the comparison between scores, and in Figure 3 the distribution of subjects who attributed maximum score (five points) for each question.

Table 3 – The Mean obtained on each question of the International Inventory – Hearing Aid and the comparison of results obtained among 22 subjects

QI-AASI	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Mean	3.73	3.68	3.55	4.09	4.09	3.86	4.00
Median	4	4	4	4	4	4	4
Standard Deviation	1.39	1.13	1.01	1.06	1.02	1.25	1.02
Q1	3	3	3	3	3	3	3
Q3	5	4	4	5	5	5	5
n	22	22	22	22	22	22	22
CI	0.58	0.47	0.42	0.45	0.43	0.52	0.43
p-value				0.191			

Caption: CI: Confidence Interval and n: sample.
Friedman Test



Caption: Q1:- question 1; Q2: - question 2; Q3: - question 3; Q4: - question 4; Q5: question 5; Q6: - question 6 and Q7: - question 7.

Figure 3 - Distribution (%) of subjects related to the higher grade applied in each question of the International Inventory –HA.

The statistical Friedman's Test highlighted there was no significant difference (p=0.191) among the mean of all questions achieved in the IOI-HA questionnaire.

Table 4 shows the mean score from the total value (gross and adjusted) and of factors 1 and 2 (gross and adjusted) found in the questionnaire application. The Wilcoxon's Test showed there was no significant difference between the score of the factor 1 adjusted and the factor 2 adjusted (p=0.758).

Table 4 – Mean score of the total (gross and adjusted) and of the factors 1 and 2 (gross and adjusted) in the application of the International Inventory – HA (n=22)

Score	Gross			Adjusted		
	Total	Factor 1	Factor 2	Total	Factor 1	Factor 2
Mean	27.00	15.50	11.50	3.85	3.88	3.83
Median	28.5	16.5	11.5	4.1	4.1	3.8
Standard Deviation	5.13	3.26	2.61	0.73	0.82	0.87
CV	19%	21%	23%	19%	21%	23%
Q1	23.3	14.0	10.0	3.3	3.5	3.3
Q3	30.0	17.8	13.8	4.3	4.4	4.6
Min	17	7	5	2.42	1.75	1.66
Max	34	20	15	4.85	5	5
n	22	22	22	22	22	22
CI	2.14	1.36	1.09	0.31	0.34	0.36
p-value	0.758					

Wilcoxon Test

Table 5 presents the results of the correlation on adjusted scores obtained by applying the IOI-HA with the variables age and time of HA fitting. There is no significant correlation between ages and fitting time with the adjusted scores, that is, statistically they are independent results.

Table 5 - Correlation of the adjusted scores (total, factor 1 and factor2) obtained from the application of the II-HA with the variables age and time of the hearing aid fitting

	II-HA Adjusted Value	Age	Time of fitting
Total	Corr	1.7%	-11.6%
	P-value	0.940	0.607
Factor 1	Corr	-0.7%	-4.4%
	P- value	0.976	0.844
Factor 2	Corr	11.1%	-31.7%
	P- value	0.624	0.151

Caption: total, factor 1 (questions 1,2,4 and 7) and factor 2 (questions 3,5 and 6)
Spearman's Correlation Test

To conclude, in the analysis presented in Tables 6 and 7 were developed comparisons between results from IOI-HA and features audiological and of amplification.

The analysis presented in Table 6 revealed that there was no significant difference between scores obtained in IOI-HA regarding degree of hearing loss, considering the better ear.

In Table 7 the Mann-Whitney's Test was used to compare adjusted scores with audiometric configuration, fitted ear and HA type. The analysis showed there was no significant difference between scores considering the variables.

Table 6 - Comparison of the adjusted scores (total, factor 1 and factor 2) regarding the degree of hearing loss of the better ear

	HL degree	Mean	Median	Standard Deviation	Q1	Q3	n	CI	p-value
Adjusted Total	normal	3.71	3.71	1.00	3.36	4.07	2	1.39	0.703
	Mild	3.71	3.86	0.59	3.28	4.18	8	0.41	
	moderate	3.99	4.28	0.94	3.71	4.85	9	0.61	
	moderately severe	3.71	3.71	0.41	3.57	3.86	2	0.57	
Adjusted Factor 1	normal	3.38	3.38	0.88	3.06	3.69	2	1.22	0.454
	Mild	3.72	3.75	0.53	3.38	4.25	8	0.36	
	moderate	3.97	4.25	1.05	3.50	4.75	9	0.69	
	moderately severe	4.13	4.13	0.88	3.81	4.44	2	1.22	
Adjusted Factor 2	normal	4.17	4.17	1.18	3.75	4.58	2	1.64	0.319
	Mild	3.71	3.83	0.78	3.25	4.33	8	0.54	
	moderate	4.03	4.00	1.03	3.66	4.66	9	0.68	
	moderately severe	3.17	3.17	0.23	3.08	3.25	2	0.32	

Caption:HL: hearing loss
Kruskal-Wallis's Test

Table 7 - Comparison of the adjusted scores (total, factor 1 and factor 2) regarding the audiometric configuration; if it was an unilateral or bilateral fitting and the hearing aid model selected (behind-the-ear or intra-aural)

	Score		Mean	Median	Standard Deviation	n	CI	p-value
audiometric configuration	Adjusted total	descending	3.91	4.07	0.70	16	0.34	0.934
		Flat	3.85	4.14	0.88	5	0.77	
	Factor 1 adjusted	descending	4.00	4.25	0.65	16	0.32	0.834
		Flat	3.70	3.75	1.23	5	1.08	
	Factor 2 adjusted	descending	3.79	4.00	0.94	16	0.46	0.708
		Flat	4.06	3.66	0.72	5	0.63	
Fitted ear	Adjusted total	Bilateral	3.87	4.07	0.65	16	0.32	0.911
		Unilateral	3.81	3.86	0.99	6	0.79	
	Factor 1 adjusted	Bilateral	3.91	4.25	0.83	16	0.41	0.709
		Unilateral	3.79	3.75	0.84	6	0.67	
	Factor 2 adjusted	Bilateral	3.83	3.83	0.70	16	0.34	0.766
		Unilateral	3.83	4.00	1.31	6	1.05	
HA model	Adjusted total	BTE	3.84	4.00	0.69	9	0.45	0.71
		Intra	3.86	4.14	0.78	13	0.43	
	Factor 1 adjusted	BTE	4.03	4.25	0.76	9	0.5	0.5
		Intra	3.77	3.75	0.86	13	0.47	
	Factor 2 adjusted	BTE	3.59	3.66	0.80	9	0.52	0.18
		Intra	4.00	4.00	0.91	13	0.5	

Caption: BTE (behind-the-ear), Intra (intra auricular)
Mann-Whitney's test

DISCUSSION

According to the Ministry of Health, currently, the questionnaire IOI-HA is included in the form of Selection and Fitting Hearing Aids (ordinance SAS/MS nº 587, from October 7th 2004) and evaluates seven areas considered to be important to the success of using the HA (use, benefit, residual activity limitation, satisfaction, residual participation restriction, impact on others' lives and life quality). International authors synthetized the IOI-HA as a questionnaire that allows making the comparison among different devices and/or settings, as well as the benefit evaluation of using the same electronic device during a time, enabling the user to recognize the advantages offered by the device regarding their hearing difficulties and psychosocial disadvantages[15]. Therefore using questionnaires which enable measuring and analyze these hearing difficulties or of the handicap, it is possible to improve the hearing aid fitting period.

In this research was interviewed 22 subjects, 12 (54.5%) being feminine gender and 10 (45.5%) masculine gender. Previous studies with the same material, presented participants' distribution very similar to this research regarding gender[16].

Tables 1 and 2 indicated that hearing loss of moderate degree, for both right and left ears, was most prevalent for the studied population (40.9%), and there was a statistical difference regarding the degrees normal, moderately severe and severe.
The most used HA was the in-the-canal type with 13 users (59.1%), although there was no significant difference (p=0.228). Related to the HA adjustment, 15 (68.2%) subjects were fitted with programmable devices. In a previous study, 50% of population was fitted with in-the-canal and the other 50% was fitted with behind-the-ear devices[17].

Table 3 shows the score for each question of the IOI-HA questionnaire. It is possible to conclude that the mean score for each question varied among 3.55 and 4.09; the median score was 4.0 for all questions. Moreover, it is possible to verify through analyzes that there was no difference of answer among questions (p=1.191). In a study also developed in the south region of the country, in 2010, the mean values verified through the seven questions varied in 3.42 to 4.67 points, these results are very similar to this study[18]. A different study developed in the north region of the country, also found mean values similar to scores which varied in 3.7 to 4.4 points. However, that study found significant difference between questions 3 and 4[7]. A

recent research (2011), with unilateral hearing loss carriers, verified mean values which varied in 3.53 to 4.73 points. Once again, the results are similar to this study[19].

Analyzing Table 3 and Figure 2, considering question number 1 that refers to the time of use the HA, it was confirmed the mean score of 3.73, median score of 4 and that 40.9% of the sample assigned maxim score to this question, that is, they reported to use the HA more than eight hours a day. In a study of 2010, 84.6% adults and 75% elderlies reported to use the HA more than eight hours a day[20] and, other study of 2011 confirmed that 66.67% of the sample use the HA more than eight hours a day[19]. Nevertheless, a study in 2005 found maximum score in 44% users of HA monaural fitted and in 56% users of HA binaural fitted[9]. In the same year, a different study verified maximum score in 30% of the fitted subjects with analogic technology and in 70% of users with digital technology[21]. This result suggests that digital technology probably provides more comfort to user enabling to use the devices longer. Some authors affirm that the fact of the users do not reject the HA use is directly related to the acceptance of the hearing loss and, consequently, to the need of amplification use, therefore, the relation between time of HA use in daily activities and adaptation to amplification can be very difficult[15].

For question 2, related to the benefit of using HA, the mean score was 3.68 and the median 4 points. Considering the median value, the HA helped fairly and 22.7% of users gave maximum score for this question, that is, they reported that the devices helped very much.

Considering the maximum score, previous studies also did not reported an elevated distribution of the subjects (13.33 to 38.9%)[19,20]. On the other hand, different studies presented results superior to 87%, but it was considered in the analysis scores 4 and 5[9,21]. Either way, when considering that the greater part of the sample attributed scores between 4 and 5, it is possible to affirm that the devices fulfill their goals and help their users.

In question 3, related to the residual limitation with the amplification use, the mean score was 3.55 points and median score was 4 points, confirming a decrease of the participation limitation by using the amplification since the greater part of the sample reported just few difficulties with the HA use. Considering the maximum score possible in the questionnaire, 18.2% of the sample reported any difficulty in situations of communication by using the hearing aid. A previous study found maximum scores in 56.30% and 39.10% of the sample, unilateral and bilateral fitting, respectively[9]. Even greater values were found in another study of the same year (2005), 75% of the sample using digital HA with bilateral fitting had no difficulty in situations of communication[21]. These results are much higher compared to those found in this research and in a study developed in 2010, in which it was observed a lower number of subjects who gave the maximum score for that question (27.7%)[7]. A recent article 2010 also revealed an inferior distribution of adults (30.8%) and elderlies (27.8%) who pointed the maximum score for this question[20]. Still, considering the last two researches mentioned, the results in this study are inferior. Nevertheless, the researches in 2010 and 2011 were developed with populations of hearing health programs and this study was developed with private office patients. That variable may have influenced the results; therefore, further research is necessary to evaluate better its effect.

The mean of answer for question 4 was 4.09 and the median was 4 point, and 45.5% of the sample reported to be very satisfied using the hearing aid, this result is a little inferior to the result found in a study developed in Rio Grande do Sul with adults (53.8%) and elderlies (52.8%) of a Hearing Health Program[20] and in another study developed in the state of São Paulo (60%)[19]. A study revealed much superior results, above 90% of the subjects satisfied. Though, in this research it was considered the sum of the answers of 4 and 5 points to reach this percentual[11]. In the same year (2005) a different study found 100% of the digital HA users reported to be very satisfied giving 5 points to this question[21].

Taking into account the residual participation restriction, analyzed in question 5, the mean answer also was of 4.09 points and the median was 4 points, and once again 45.5% of the sample applied the maximum score for this item, verifying absence of participation restriction due to the hearing loss. In study conducted in Santa Maria, in 2010, 46.1% of the adults and 36.1% of the elderlies interviewed reported that after fitting, the hearing difficulties do not affect on their daily activities[20]. Oppositely, a study conducted in 2011, 80% had the same report[19]. It can be verified a variation of the evaluation in this aspect analyzed by the question considering the present and previous studies.

In the question that evaluates the impact of the hearing impairment in others (question 6) the mean and median score were 3.86 and 4 points, respectively. Again, it was observed that 45% of the sample presented the maximum score for this question emphasizing that using the amplification, the problems caused by the hearing impairment stop to affect or upset other people. The literature shows different and greater results, for example in the study conducted in 2010, both groups (53.8% adults and 72.2% elderlies) reported that their

hearing problems do not caused negative impact on others[20].

In a study of 2011, 60% of the sample reported the same[19]. And in 2005, 70% of the group with digital technology users answered that the hearing problem does not affect their relation with others[21].

Eventually, question 7 evaluated the change in users' life quality by using the HA. Maximum score was assigned by 40.9% of the sample, which means that, now, they had much more joy on living. The mean and median score was of 4 points. A previous study found slightly inferior results for both adults and elderlies (31%)[20]. Once again, the study of 2005, demonstrated results much superior to this and other studies, in which 95% of the sample presented maximum score, that is, answered "much more join on living"[9].

The factors 1 and 2 reflect the relation of the subject and their HA and their environment. Table 4 confirms for both factors high mean scores, emphasizing good results of fitting. It was verified for the gross value of factor 1 15.5 points (maximum score of 20 points) and for factor 2 11.5 points (maximum score of 15 points). Previous national studies and with hearing health programs populations also had high values for factors 1 and 2[7,22]. In the present study it was not observed significant differences (p=0.758) between adjusted scores of factor 1 (3.88) and factor 2 (3.83), as in a study conducted in 2010[7].

Table 5 described correlation analysis made to detect if the variables age and time of using the HA, had influence on the results of the questionnaire. It was confirmed that neither subjects' age or time of using the HA interfered on the results of total score and of factors 1 and 2.

Finally, Tables 6 and 7 demonstrated that variables as degree of hearing loss, audiometric configuration, uni and bilateral fitting and the HA type also did not have influence on the IOI-HA results.

A previous study, also conducted in the south region of the country and with a sample of a hearing center, showed there was no difference among IOI-HA scores, considering uni and bilateral fitting[9].

Regardless if the audiologist works in a hearing health program or private clinic, is important and efficient to use materials that may assist the validation process of results. Still, authors suggest the application of the IOI-HA questionnaire during a rehabilitation process to assist in guidance for using the HA[23].

CONCLUSION

This research showed that 40.9% of the sample use the HA more than eight hours a day, 45.5% of the users affirmed to be very satisfied using the hearing aids and 40.9% affirmed that, currently, they had much more joy on living. These results emphasize the benefit of using the device and the improvement of life quality.

Through the application of the IOI-HA questionnaire it was verified that using the hearing aid has benefic effect for its users and they showed themselves satisfied with its use.

RESUMO

Objetivo: verificar o efeito do uso da amplificação sonora em deficientes auditivos por meio de um questionário de autoavaliação. **Métodos:** utilizou-se o Questionário Internacional – Aparelho de Amplificação Sonora Individual, composto de sete questões. Avaliaram-se 22 sujeitos com idade entre 32 e 85 anos, portadores de perda auditiva neurossensorial bilateral de grau leve a severo, pós-lingual, usuários de aparelho de amplificação sonora individual com adaptação unilateral ou bilateral pelo período mínimo de 12 semanas. **Resultados:** o escore médio da pontuação total obtido na aplicação do questionário foi de 27 pontos e não houve diferença significante (p=0,191) entre as pontuações obtidas nas sete questões do questionário, sendo o valor médio de 3,85 pontos. Não houve correlação dos resultados com a idade dos pacientes nem com o tempo de uso da amplificação. Não houve diferença significante no escore total do questionário bem como dos fatores 1 e 2 considerando: grau da perda auditiva, configuração audiométrica, modelo de aparelho de amplificação sonora individual e adaptação unilateral ou bilateral. **Conclusão:** com a aplicação do questionário verificou-se que o uso da amplificação sonora tem efeito benéfico para seus usuários e que estes se mostraram satisfeitos com o uso.

DESCRITORES: Satisfação do Paciente; Qualidade de Vida; Auxiliares de Audição; Questionários

REFERENCES

1. Instituto Brasileiro de Geografia e Estatística (IBGE). http://www.ibge.gov.br/home/presidencia/noticias.
2. Ministério da Saúde. Portaria número. 2.073/GM de 28 de setembro de 2004. Institui a Política Nacional de Saúde Auditiva.
3. Russo ICP, Almeida K. O processo de reabilitação audiológica do deficiente auditivo idoso. In: MarchesanIQ, Bolaffi C, Gomes ICD, ZorziJL. Tópicos em Fonoaudiologia. São Paulo: Editora Lovise; 1995. p.429-46.
4. Dillon H. Assessing the outcomes of hearing rehabilitation. In: Dillon, H. Hearing Aids. New York, Thieme; 2001.p. 95-103.
5. Lacerda CF, Silva LO, Canto RST, Cheik NC. Efeitos da adaptação às próteses auditivas na qualidade de vida, no equilibrio e no medo da queda em idosos com perda auditiva neurossensorial. Int Arch Otorhinolaryngol. 2012;2(16):156-62.
6. Costa LP, Iório MCM. Próteses auditivas: avaliações objetivas e subjetivas em usuários de amplificação linear e não-linear. Pró-Fono R Atual Cient. 2006;2(10):21-30.
7. Arakawa AM, Picolini MM, Sitta EI, Oliveira AN, BassiAKZ, Bastos JRM et al. Aavaliação da satisfação dos usuários de AASI na região Amazônica. Arq Int Otorrinolaringol. 2010;1(14):38-44.
8. Gnewikow D, Meredith M. Hearing aid outcomes with open and closed- canal fittings. The Hearing Journal. 2006;11(59):66-72.
9. Mangi C, Armentano UM, Moreira OS, Winter EW. Investigação do grau de satisfação entre usuários de amplificação monoaural e binaural. Distub. Comum. 2005;17(3):323-32.
10. Cox RM, Stephens D, Kramer SE. Translations of the international out come inventory for hearing aids (IOI-HA). Int J Audiol. 2002;41(1):3-26.
11. Cox RM. Assessment of subjective outcome of hearing aid fitting: getting the client's point of view. Int J Audiol. 2003;42(Suppl1):S90-6.
12. Teixeira CF, Augusto LGS, NETO SSC. Prótese auditiva: satisfação do usuário com sua prótese e com seu meio ambiente. Rev CEFAC. 2008;10(2) 245-53.
13. Cox RM, Alexander GC: Expectations about hearing aids and their relationship to fitting outcome. J Am Acad Audiol. 2000;11(7):368-82.
14. Davis H, Silverman RS. Hearing and deafness. Nova York: Rinehart & Wiston; 1970.
15. Huch JL, Hosford-Dunn H. Inventories of Self-Assessment Measurements of Hearing Aid Outcome. In: Sandlin RE. Hearing aid amplification: technical and clinical considerations. San Diego: Singular Publishing Group; 2000. p.489-555.
16. Godinho R, Keogh I, Eavey R. Perda auditivagenética. Rev Bras Otorrinolaringol. 2003;1(69):100-4.
17. Rodrigues PC, Oliveira AC, Colafêmina JF, Menezes PL. Localização sonora em usuários de amplificação sonora individual. Rev CEFAC. 2010;3(12):377-83.
18. Gasparin M, Menegotto IH, Cunha CS. Propriedades psicométricas do questionário internacional – aparelho de amplificação sonora individual. Braz J Otorhinolaryngol. 2010;76(1):85-90.
19. José MR, Campos PD, Modelli MFCG. Unilateral hearing loss: benefits and satisfaction from the use of hearing aids. Braz J Otorhinolaryngol. 2011;2(77):221-8.
20. Lopes AS, Costa MJ, Aurélio NHS, Santos SN, Vaucher AV. A satisfação e desempenho de usuários de próteses auditivas atendidos em um programa de atenção à saúde auditiva. Rev CEFAC. 2010;13(4):698-709.
21. Magni C, Freiberger F, Tonn K. Avaliação do grau de satisfação entre os usuários de amplificação de tecnologia analógica e digital. Rev Bras Otorrinolaringol. 2005;5(71):650-7.
22. Zambonato TCF. Adaptação de aparelho de amplificação sonora individual em indivíduos com fissura labiopalatina [dissertação]. Bauru (SP): Hospital de Reabilitação de anomalias craniofaciais da Universidade de São Paulo; 2007.
23. Heuermann H, Kinkel M, Tchorz J. Comparison of psychometric properties of the International Outcome Inventory for Hearing Aids (IOI-HA) in various studies. Int J Audiol. 2005;44(2):102-9.

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