

Hearing aid adaptation in users assisted by the Unified Health System

Adaptação à prótese auditiva em usuários assistidos pelo Sistema Único de Saúde

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ABSTRACT

Purpose: To evaluate the adaptation to hearing aids by users attended by the Brazilian public health system (SUS), and to propose educational actions, based on the users' needs. **Methods:** Descriptive quantitative research, which evaluated 32 adults with hearing loss during the adaptation of hearing aids provided by the Unified Health System (SUS). Two structured questionnaires with closed questions were applied, and the data received descriptive analysis. **Results:** Moderate limitations and restrictions were observed, as well as reduced time of daily use, limiting the benefit of amplification. Regarding use and handling, it was observed that 70.8% put on and take off the device by themselves, 79.2% take it off to bathe, 87.5% do not perform daily hygiene, and 37.5% have allergies or pain attributed to the use of the mold. **Conclusion:** Users present difficulties in the use and handling of hearing aids, which negatively influence their adaptation to it. Actions to promote hearing health are necessary, with the aim to minimize these difficulties and facilitate hearing aid adaptation.

Keywords: Hearing; Hearing aids; Adaptation; Hearing loss; Health education; Unified Health System

INTRODUCTION

Hearing is one of the most important senses of a human being for the development of oral communication. It is through hearing that we hear the environment sounds and develop cognitive and psychosocial abilities. Hearing loss, also called hearing impairment, disables the individual to perform these abilities. Hearing loss in children hinders the development of language, and in the elderly causes isolation, decreasing the individual's communication and social interaction abilities⁽¹⁾.

According to the Ministry of Health⁽²⁾, the disability began to be understood as a part or expression of a health condition, establishing the interaction between the disabled person, the activity limitation, and the factors of the socio-environmental context.

Hence, on September 28, 2004, it was established in Brazil the National Policy of Hearing Health Attention and Ordinances SAS/MS n° 587 and 589, which propose the

organization of a medium and high complexity hierarchical network, regionalized and integrated in primary care, to care for the hearing impaired⁽²⁾.

After diagnosis and indication of hearing aid amplification by the otorhinolaryngologist, the audiologist is responsible for selecting the model and the type of hearing aid more suitable for the individual with hearing impairment, according to his/her needs and priorities to minimize the damage of social deprivation⁽³⁾. Therefore, it is essential that the individual is clarified about the phase of hearing aid adaptation and the (re)habilitation stages, ensuring better understanding of the benefits, care, handling, insertion, and expectations of the individual regarding its use⁽⁴⁾.

It is worth mentioning that the adaptation phase is influenced by the use and handling of the hearing aid, and that the elderly individual presents difficulties handling the device, mainly in the insertion and removal of the ear mold. The elderly also find it difficult to use technology, regarding the use of telephone coil or even the memories of the hearing aid, when the technology is digital; when the technology is analogue, the individual presents another type of difficulty, related to the interferences of technology⁽⁵⁾.

Research related to the use and handling of the hearing aid in the adaptation phase reveals that 12.90%, 58.06% and 67.74% of the subjects investigated presented difficulties related to the batteries, the ear molds or capsules, and the characteristics of amplification, respectively⁽⁶⁾.

Study conducted in a hearing rehabilitation service of the High Complexity Hearing Health Program of the Hospital General Edson Ramalho – HPM – João Pessoa (PB), Brazil.

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Based on this understanding of care with the hearing aid, which include both the adaptation care to programmable electroacoustic characteristics and the care regarding the use and handling of the hearing aid – which must be oriented by the same professional that monitors the selection and adaptation of hearing aids –, the theme of hearing health of Unified Health System users, according to the objectives of the National Policy of Hearing Health Attention, in view of socio-economic characteristics is considered relevant. Hence, it is observed a great handling and adaptation difficulties with the hearing aids.

Thus, the purposes of this research were to evaluate the hearing aid adaptation of users assisted by the Unified Health System, and to propose educational actions in service, based on the needs of users of sound amplification assisted by the Unified Health System.

METHODS

The recommendations of Resolution nº 196/96 regarding the clarification of subjects about the research, the right to refuse their participation and to withdraw from it at any time and without any burdens, as well as the secrecy of their identity, were followed, and participants signed the Free and Informed Consent Form. Before the beginning of data collection, the study was authorized by the institution and approved by the Research Ethics Committee of the Hospital Universitário Lauro Wanderley, under protocol 309/2010.

The study was carried out at a hospital complex in João Pessoa (PB), Brazil, where there is a Hearing Rehabilitation Service bound to the Hearing Health Attention Program (Ordinance SAS/MS nº 587, 10/7/2004). The study population consisted of 449 users who have benefited from hearing aid technology in the year of 2009, provided by the Unified Health System (*Sistema Único de Saúde* – SUS) in the aforementioned municipality. From the total number of registered users, the study enrolled adults with hearing impairment in the process of hearing aid adaptation. It was considered as inclusion criteria: hearing aid use for at least six months, and voluntary agreement to participate in the study, after receiving explanation about the purpose and methods and signing the Free and Informed Consent Term. Children and adolescents, and adults without oral language, unable to adequately respond and understand the questionnaire, were excluded from the sample, as well as users who did not attend the service at the time of the study and those who did not agree to participate in the study. Hence, participants were 32 users, 17 women and 15 men, with ages between 21 and 95 years.

Data collection was conducted during the period of March to May 2010, through the application of two questionnaires: the first containing questions regarding the socio-demographic profile, the use and handling of batteries, ear molds or capsule, and the care with the hearing aid circuit; the second was the *International Outcome Inventory for Hearing Aids* (IOI-HA), an instrument that is included in the Form for Selection and Adaptation of Hearing Aids of the Ordinance SAS/MS nº 587, of 10/07/2004⁽⁷⁾.

The *International Outcome Inventory for Hearing Aids* (IOI-HA) was translated by Brazilian researchers⁽⁷⁾, and

developed to carry out self-evaluation measures of hearing rehabilitation, that is, it has the objective to measure hearing aid adaptation.

The IOI-HA is composed by eight questions with few cognitive requirements for the individuals. One question has the aim to estimate the degree of hearing difficulty that the individual presents without using the hearing aid, and seven questions assess, subjectively, the result of hearing aid adaptation, one in each of the following aspects: benefit, residual activity limitation, satisfaction, residual participation restriction, impact on others, and quality of life.

The questionnaire offers five possible answers graded from left to right, in a way that the first option refers to the worst performance, scoring 1 point; the last option indicates the best performance, scoring 5 points.

After questionnaire application, eight of the 32 hearing aid users who participated in the research did not answer the first questionnaire because they did not show up for the second phase of the study. Therefore, we analyzed the responses of 24 users to both questionnaires, and the responses of the total number of participants (32) to the IOI-HA.

The results of both questionnaires were descriptively analyzed (absolute and relative numbers, mean, and standard deviation) and presented in tables, and were then discussed in light of the relevant literature.

RESULTS

The age range of the users who answered both questionnaires (24) was variable: 8.3% were between 21 and 40 years old, 16.7% between 41 and 60 years old, 50% between 61 and 80 years old, and 25% between 81 and 100 years old. As for gender, 34.38% of the participants were women, and 65.63% were men. With regards to the model and technology of the hearing aid, only 12.5% used programmable intra-canal digital hearing aids, and 87.5% used programmable (38.1%) and non-programmable (61.9%) behind-the-ear digital hearing aids.

The analysis of the items related to the handling of the hearing aid showed that most users do not present difficulties regarding the placement and removal of the hearing aid, nor the adjustment of the battery. It is important to note that 70.8% of the individuals refer to put on the device by themselves (Table 1).

Table 2 shows the mean and standard deviation obtained for the total score on the IOI-HA questionnaire, applied to the hearing aid users after at least six months of adaptation. Values are presented by the mean of the sum of points (ST) obtained in each of the seven questions. Thus, the minimum total score is one and the maximum is five points. A higher score indicates better results regarding the hearing aid adaptation.

Table 2 shows that most of the mean scores for each analyzed item was a little over three, which cannot be considered satisfactory, because it demonstrates little positive adaptation to sound amplification.

DISCUSSION

The data evidence that most of the hearing aid users is

Table 1. Difficulties regarding the handling and care of hearing aids

Variables	Yes		No	
	n	%*	n	%*
Handling the hearing aids				
Difficulty in identifying the left and right devices	11	45.8	13	54.2
Puts on/removes the hearing aid alone	17	70.8	7	29.2
Removes the battery when not using the device	16	66.7	8	33.3
Opens/closes the place where the battery is located	19	79.2	5	20.8
Changes the battery without help	20	83.3	4	16.7
Identifies when the batteries run off	15	62.5	9	37.5
Uses the telephone coil to talk on the phone	0	0.0	24	100
Care with hearing aids				
Removes the hearing aid to take a bath	19	79.2	05	20.8
Is careful not to drop off the hearing aid	23	95.8	01	4.2
Cleans the device daily	06	25	18	75
Care with the mold				
Lends the mold or capsule of the hearing aid	01	4.2	23	95.8
Is aware that the mold or capsule must be redone yearly	03	12.5	21	87.5
The mold has already caused allergy or pain	09	37.5	15	62.5
Washes the mold daily	03	12.5	21	87.5
Knows how to wash the mold	02	8.3	22	91.7
Removes/puts on the mold of hearing aids	16	66.7	08	33.3

* The percentage values were obtained from the total number of 24 SUS users

Table 2. Adaptation to sound amplification, according to the components of the IOI-HA questionnaire

Variables	Mean (x)	SD (s)
Daily use	3,13	1.191
Benefit	2,88	1.116
Limitations	2,71	0.908
Satisfaction	3,25	1.225
Restrictions	3,50	1.351
Socialization	3,50	1.251
Quality of life	3,38	1.173

Note: SD = standard deviation

older than 60 years old, which was expected, because one of the causes of decline in the hearing acuity is aging^(1,8).

Regarding the handling of the hearing aid, similar results were found in a study of a sample with the same characteristics of ours, in which 72% of the users placed the device without difficulties, and 28% reported that needed to help to do this⁽⁶⁾.

Considering that most of our subjects were over 61 years of age, the fact that they were able to handle the hearing aid without difficulty was satisfactory, since these users has preserved enough motor coordination to use the hearing aid, encouraging their independence in the decision of the moments to put it on and to remove it, according to their need and desire to hear. However, one cannot ignore the percentage of users who reported difficulties in this respect, showing that it is relevant to the search for the factors that determine these difficulties, as well as to propose strategies to minimize them.

The difficulties of elderly individuals in handling the hearing aid is an aspect also identified in literature⁽⁵⁾, especially regarding the insertion and removal of the ear mold, the use of telephone coil and memories of the digital hearing aid; in analogue hearing aids, the difficulties usually involve technological interferences.

The telephone coil has the aim to improve communication on the telephone, making the speech more intense and intelligible⁽⁹⁾. Researchers consider the non-use of telephone a negative factor in relation to the satisfaction in using the hearing aid⁽¹⁰⁻¹²⁾. In this research, we found low scores regarding the efficacy of the hearing aid for the use of telephone, because none of the individuals uses the coil for improvements in the communication over the telephone.

Compliance in the care of the hearing aid in order not to wet the internal circuit and not to let it fall to the ground is essential for the proper conservation of the device, and it is focused on the guidelines provided by audiologists during the sessions of adaptation and hearing rehabilitation, since the exposure of the hearing aid to water can cause oxidation, and falls may damage the electronic circuit of the device⁽¹³⁾.

Daily cleansing is one of the basic guidelines provided to the user of hearing aids; it must be carried out not only in the initial consultation before the use, but also reinforced in all their returns to the hearing health service. Dirt on the equipment can determine its malfunction when, for example, it causes clogging of ventilation or of the silicone tube of the mold, blocking the exit of the sound^(13,14), or causes itching and, subsequently, external auditory infections. The presence of droplets of water in the tube also characterizes bad hygiene, and may cause blasting⁽¹³⁾.

In face of this evidence and the delicacy of its implications to the users' hearing health, it is necessary to investigate the reasons for which they do not perform the daily cleansing of the hearing aid, in order to propose interventions that reverse this situation, thus promoting the improvement of the quality of the actions developed by the service.

It is known that the molds are for individual use, and that they must be washed daily to minimize the risks of disorders of the external auditory meatus. Therefore, the shared use of the mold, associated with the lack of daily hygiene, increases the risk of poor adaptation of the hearing aid.

We should also consider that patients with seborrheic dermatitis or excessively oily skin present an intense amount of natural cerumen in the auditory canal, that must be removed periodically⁽¹⁴⁾.

Another determining factor may be the inappropriate use of the mold due to the wear of the material and/or anatomical changes. To prepare a new mold, authors have mentioned reasons such as: to be causing injuries or allergies, to be too small; in the case of adults, the mold may widen up the ear and become loose; old mold and/or damaged by the time of use; changes in the auditory thresholds^(13,14). Aspects of this nature can influence sound amplification and reduce the user's satisfaction.

Regarding the cleanliness of the hearing aid, the result obtained can be considered alarming when compared to another study that evidenced that only 3.2% of the individuals reported not to know how to perform the cleansing of molds⁽⁶⁾.

The results of this study about the daily use differ from other studies^(3,7,15) that observed a high score, above four points, showing more positive results for hearing aid adaptation.

If the users surveyed do not use sound amplification for at least four hours, the minimum period of time considered to be effective for adaptation in this initial phase⁽¹⁶⁾, the results obtained can be considered unsatisfactory, since longer periods of use contributes positively to the adaptation. Studies have shown that after three months of use the benefit of the hearing aid for the speech intelligibility can already be noted, especially in noise, as long as individuals use it for a period of at least four hours^(3,15,17).

Some factors may contribute to the use of hearing aid for a limited time. The difficulty of access to the batteries needed for operating the device is one of the aspects present in low-income populations, because the concern that the charge of the battery will cease and they won't have financial resources to buy a new battery is a reality verbalized by the participants.

In addition to the financial aspect, other factors contribute to the reduced use of hearing aids, including motor difficulty, perceptual difficulty regarding the sound sensation or related to comfort, according to the physical adaptation to the mold or capsule⁽¹⁾. The discomfort related to the adjustment of the ear mold to the auricular pavilion or of the capsule to the external auditory canal was referred in a research⁽⁶⁾ as one of the factors that may cause discomfort, pain and injury in the auricular pavilion and the external auditory canal after some time of use.

The difficulties related to sound amplification can also be limiting to the use of the device, causing, for example, hearing discomfort for high intensity sounds, which may make the user

feel the need to reduce the volume, changing the gain of the hearing aid, or not using it constantly⁽¹⁾.

The evidence on the low benefit of sound amplification can be due to the fact that 75% of the users surveyed are in the age groups above 61 years and, with the increase of age, speech recognition abilities gradually deteriorate, because of the aging of the auditory system, and the noisy environments are particularly more problematic for elderly users of hearing aids⁽¹⁷⁾.

To favor the maximum benefit from the use of sound amplification, studies⁽¹⁸⁾ have concluded that the more time the individual uses the hearing aid daily, the better his communicative performance and, consequently, the better his/her relationship with the people around and the exchange of information. The authors have shown that the time using the hearing aid influences the benefit obtained by it. In our study, it was not possible to compare the condition previous to the use of sound amplification to the obtained after hearing aid adaptation, because in addition to not constituting a specific purpose of this research, the participants had already been using hearing aids before the study.

Another relevant aspect to be considered is that the orientation process for the relatives and the user of hearing aids is essential so that the use of the device is effective and obtains its full benefits⁽¹⁹⁾.

In this respect, some authors⁽²⁰⁾ have mentioned the importance to advise both the elderly user of the hearing aid and his/her family members, improving their comprehension of the limitations, their positive attitude facing communication difficulties, and their motivation to effectively use the device.

People who live with elderly users of hearing aids need to know about the limitations of the hearing loss and the hearing aids, as well as the appropriate ways to compensate them by using communication strategies for both the listener and the speaker⁽²¹⁾.

The variable limitation presented in Table 2 evidences a low level of satisfaction regarding the use of hearing aids, when compared to other studies^(10,22), in a high satisfaction was verified. It is important to mention that satisfaction is measured by the self-perception of each user, differing between individuals, because it varies according to specific needs and expectations.

The restriction on daily living activities is one of the conditions identified in elderly individuals with hearing aids⁽²³⁾. Studies have shown that the deterioration of the auditory function, that accompanies the aging process, affects both communication and social and emotional domains, since it causes a significant reduction in interaction and personal contacts⁽²⁴⁾.

With regards to the quality of life of individuals in this study, results show that the use of hearing aids is a positive influence, however, it is undermined by aspects of social limitation.

Thus, the social relationship of the elderly is affected by the disabling consequences of aging, initiating a process of devaluation and lowering of self-esteem, aggravated by his/her communication difficulty⁽²⁵⁾, therefore reducing the quality of life of the individual with social limitations. Studies have clearly shown the social difficulties experienced by elderly users of hearing aids^(8,24). The evidence of communication difficulties, even with the use of sound amplification, observed in

the present study indicates that the hearing aid alone does not reach one of its most important objectives, that is, facilitating communication, contributing to the improvement of social life.

Some authors^(21,26) consider that auditory training helps the individuals in the process of hearing aid adaptation to improve the abilities of speech recognition, including those in which spontaneous changes are observed in the course of time. It is believed that this process helps to remove the individual from isolation, allowing better quality of life⁽²⁷⁾. Thus, some researchers^(7,28,29) have suggest the application of the IOI-HA questionnaire during the rehabilitation process in order to help in the possible guidelines for the use of hearing aids.

Recognizing the need for the proposition of health education actions is initially understand that these are not restricted only to guidelines regarding care and handling hearing aids during the initial consultations and futures returns. It is of considerable importance to understand that health education involves essential learning elements that generate motivation

for the development of abilities and changes in the trajectory of life, based on participation and dialog⁽³⁰⁾.

From this perspective, hearing aid users will take part in a process of continuous training, in which they should feel motivated and responsible for taking care of their own health.

CONCLUSION

The users of hearing aids assisted by the Unified Health System (SUS), participants in this study, present difficulties regarding the use and handling of the devices, that negatively influence their adaptation. These difficulties interfere with the daily use of sound amplification.

The results obtained evidence the importance of the promotion of hearing health education actions, helping the planning of strategies and the development of educational materials that promote the training of the users, in order to minimize the adaptation difficulties.

RESUMO

Objetivo: Avaliar a adaptação à prótese auditiva pelos usuários assistidos pelo Sistema Único de Saúde (SUS) e propor ações educativas em serviço, com base nas necessidades dos usuários. **Métodos:** Pesquisa descritiva, de natureza quantitativa, em que foram avaliados 32 adultos com deficiência auditiva, em fase de adaptação à prótese auditiva, que receberam pelo SUS. Foram aplicados dois questionários estruturados com questões fechadas, sendo realizada a análise descritiva dos dados. **Resultados:** Verificaram-se limitações e restrições moderadas e tempo reduzido de uso diário, dificultando o alcance do benefício do uso da amplificação sonora. Em relação ao uso e manuseio, foi observado que 70,8% coloca e retira o aparelho sozinho, 79,2% retira-o para tomar banho, 87,5% não realiza a higienização diariamente e 37,5% apresenta alergia ou dor atribuída ao uso do molde. **Conclusão:** Os usuários apresentam dificuldades em relação ao uso e ao manuseio da prótese, as quais influenciam negativamente na adaptação ao mesmo. Mostra-se necessária a promoção de ações de educação em saúde auditiva, a fim de minimizar tais dificuldades e favorecer a adaptação ao uso de prótese.

Descritores: Audição; Auxiliares de audição; Adaptação; Perda auditiva; Educação em saúde; Sistema único de saúde

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