

Management of audiological monitoring of adults and older adults Hearing aids users

Gestão do acompanhamento audiológico de adultos e pessoas idosas usuários de aparelho de amplificação sonora individual

Gestión de la monitorización audiológica de adultos y personas mayores mediante dispositivos personales de amplificación de sonido

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Abstract

Objective: The objective of this study is to analyze the reasons why hearing aid users request care at the reference service, considering the needs and audiological characteristics of users, as well as the team and the procedures performed. Therefore, one of the objectives of this research is to find and classify the return demand from users to find solutions to the growing demand. **Method:** This is a prospective and cross-sectional study. Adult hearing aid users (over 18 years of age) who requested a return during the month of August 2020 participated in the study. The sample of this study consisted of 177 participants. **Results:** Most people, with an average age of 62.84 years, have a mild to moderate degree of sensorineural hearing loss. Hearing aid malfunctions and the need for modifications topped the list of daily care concerns. Most participants required a comprehensive care team, while the others

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only needed a basic care team. The subjects required audiological monitoring, hearing aid exchange, hearing aid adjustments and, in some cases, questions about ear molds or medical reports related to the professional conduct carried out. **Conclusion:** We concluded that the age of the hearing aid and the date of the last audiometry helped to form the team and the type of consultation.

Keywords: Hearing Loss; Hearing aids; Follow-up service; Unified Health System; Audiology.

Resumo

Objetivo: O objetivo deste estudo é analisar os motivos pelos quais os usuários de AASI solicitam atendimento no serviço de referência, levando em consideração as necessidades e características audiológicas dos usuários, bem como a equipe e os procedimentos realizados. Sendo assim, um dos objetivos desta pesquisa é encontrar e classificar a demanda de retorno dos usuários para encontrar soluções para a crescente demanda. **Método:** Este é um estudo prospectivo e transversal. Participaram do estudo adultos (maiores de 18 anos) usuários de AASI que solicitaram retorno durante o mês de agosto de 2020. A amostra deste estudo foi composta por 177 participantes. **Resultados:** A maioria das pessoas, com a média de idade de 62,84 anos, possui grau leve a moderado de perda auditiva neurossensorial. O mau funcionamento dos aparelhos auditivos e a necessidade de modificações encabeçavam a lista de preocupações dos cuidados diários. A maioria dos participantes necessitou de uma equipe de cuidados integrais, enquanto os demais necessitaram apenas de uma equipe de cuidados básicos. Os sujeitos necessitaram de acompanhamento audiológico, troca de AASI, ajustes do AASI e, em alguns casos, questionamentos sobre moldes auriculares ou laudos médicos relacionados à conduta profissional realizada. **Conclusão:** Concluímos que a idade do AASI e a data da última audiometria ajudaram a formar a equipe e o tipo de consulta.

Palavras-chave: Perda Auditiva; Auxiliares de Audição; Atendimento de Seguimento; Sistema Único de Saúde; Audiologia.

Resumen

Objetivo: El objetivo de este estudio es analizar los motivos por los que los usuarios de audífonos solicitan atención en el servicio de referencia, teniendo en cuenta las necesidades y características audiológicas de los usuarios, así como el equipo y los procedimientos realizados. Por lo tanto, uno de los objetivos de esta investigación es encontrar y clasificar la demanda de retorno de los usuarios para encontrar soluciones a la creciente demanda. **Método:** Se trata de un estudio prospectivo y transversal. En el estudio participaron usuarios adultos de audífonos (mayores de 18 años) que solicitaron devolución durante el mes de agosto de 2020. La muestra de este estudio estuvo conformada por 177 participantes. **Resultados:** La mayoría de las personas, con una edad promedio de 62,84 años, tienen un grado de pérdida auditiva neurossensorial de leve a moderada. El mal funcionamiento de los audífonos y la necesidad de modificaciones encabezan la lista de preocupaciones de cuidado diario. La mayoría de los participantes requirieron un equipo de atención integral, mientras que los demás solo necesitaron un equipo de atención básica. Los sujetos requirieron seguimiento audiológico, intercambio de audífonos, ajustes de audífonos y, en algunos casos, consultas sobre moldes de oído o informes médicos relacionados con la conducta profesional realizada. **Conclusión:** Concluimos que la antigüedad del audífono y la fecha de la última audiometría ayudaron a formar el equipo y el tipo de consulta.

Palabras clave: Pérdida Auditiva; Audífonos; Servicio de seguimiento; Sistema Único de Salud; Audiología.

Introduction

Hearing impairment is among the eight chronic diseases that most cause functional limitations and affects more than 10% of the population¹. The study of the global burden of the disease, in relation to the years lived and lost as a result, carried out every five years, placed hearing impairment and visual impairment as the second and third highest incidence among worldwide disabilities.

Results of the Demographic Census carried out in Brazil² indicate that 23.9% of the Brazilian population has at least one disability, corresponding to 45.6 million people, of which 5.1% declare permanent difficulty hearing, even with the use of individual hearing aids (AASI).

Studies on hearing rehabilitation and management of hearing health services are welcome given the growing population demand for these treatments and mainly due to the need to monitor patients who receive their hearing devices through the Unified Health System (SUS). After receiving the hearing aid, the patient goes through a process of neural auditory accommodation, which requires guidance and fine adjustments until effective use of the devices, which creates the need for some returns to the service.

The first most effective regulation of the granting of hearing aids occurred with the publication of ordinance SAS/MS n° 432 of November 14, 2000, by the Ministry of Health (MS), which promoted the process of diagnosis and granting of hearing aids in the outpatient setting.

An analysis of outpatient production in hearing health carried out in the first half of 2004 in SIA/SUS records demonstrated concern about the care offered to users in health establishments accredited by the State Health Departments, which were mainly focused on the donation of hearing aids³.

Faced with the need to organize care for people with hearing impairment at all levels of SUS care, the Ministry of Health established the National Hearing Health Care Policy (PNASA) in September 2004⁴ and, for the first time, included hearing health at all levels of health, basic, medium and high complexity care, incorporating audiological monitoring and speech therapy as part of the speech therapy intervention process. A few years later, in 2011, the National Plan for the Rights of People with Disabilities - Living Without Limits⁵, incorporated hearing health into the federation's

health network, across all life cycles. Rehabilitation then becomes the axis of intervention with people with disabilities (PWD), with procedures ranging from identification and diagnosis to the social and educational inclusion of PWD.

In December 2023, the Federal Government revoked the 2011 decree and published the New Plano Viver Sem Limite (Brasil, 2023)²³, whose organization is formed around major axes in relation to the rights of people with disabilities, or better said, strategic objectives that should be aimed at PWD in relation to social participation, violence and ableism. Access to technology and social inclusion are presented with greater coordination between ministries and in the different dimensions of life in society.

The MS ordinances aim to implement and intensify actions that are already developed for the benefit of people with disabilities. In this sense, the current MS plan recommends a series of procedures for diagnosis, adaptation of electronic devices and rehabilitation for people with hearing impairment, always aiming at social inclusion.

Rehabilitation services must follow protocols and procedures described in the rehabilitation instructions for people with disabilities published by the Ministry of Health⁶. As recommended by the rehabilitation instruction for hearing impairment, all adult patients who receive hearing aids at the service are advised to return at least once a year for audiological monitoring, or whenever they have a problem using amplification⁶. The monitoring process involves specialized care with the aim of identifying the difficulties and needs of these patients and audiological monitoring.

The biggest reason why users return hearing aids granted in a hearing health care service are complaints about hearing aid adjustments. The study suggests the need for follow-up or more speech therapy sessions, especially at the beginning of hearing aid adaptation.

Based on the analysis of outpatient procedures produced after the implementation of PNASAs, another study identified a reduction in the number of audiological follow-ups over time to the detriment of the number of hearing aid concessions, perhaps due to difficult access or low user adherence⁸. The SIA-SUS numbers must be analyzed with caution due to typing errors or even the failure to record procedures performed, but it is necessary for the evaluation of managers and the service to enable



the adaptation of the procedure to better serve the user population. There is a need for coordination with all levels of care so that subjects in need of care, rehabilitation and guidance can be identified.

Over the 20 years since the publication of PNASA, services have had a very high demand for audiological monitoring, as new patients continue to arrive at the services, and old ones remain for a long period of time, and the service becomes reference for maintenance and monitoring of subjects. Some experiments^{9,10} have established emergency procedures to solve simpler problems that prevent continued use of the electronic device, such as changing receiver filters, mold tubes, hooks and broken battery drawers. However, in most complaints, the demand for care generates the need for a multidisciplinary team composed of an otorhinolaryngologist, speech therapist and social worker to carry out medical consultations, audiological assessments, check amplification and functioning of hearing aids, adjustments, making molds, family guidance and speech therapy⁷. There are cases of need to replace hearing aids with malfunctions, lost or stolen devices and former patients using devices for long periods, which also implies the need for a complete multidisciplinary team to provide care¹⁰.

The high demand of patients to undergo audiological monitoring implies the management of services in terms of organizing the teams' schedules, use of rooms, equipment, human resources and number of vacancies. Service quality is related to the degree to which the characteristics of a service meet the objectives for which it was created, and the history of the processes carried out in each return, compared to the reasons for user return, can be the starting point to improve the organization of processes and available staff in accordance with established demands¹¹.

It is known that it is essential to know the profile of the population served for management and planning in health units and that knowledge of the demands of the service guides the decisions and practices of the care provided¹².

This research aims to identify and classify the need for hearing aid users to return to a clinic in the context of the high demand from patients for annual audiological monitoring, which forces services to adapt to ensure continuity of care for the population. This challenging situation of demand that grows exponentially with the return of former users for audiological monitoring each year generated

the need to propose solutions for the organization of processes and teams, so that the service could meet the needs of the population.

Objective

Analyze the demands of the request to return to the reference service of adults and elderly people using hearing aids, correlating audiological characteristics, with the team and the processes carried out in the service.

Methods

This is a cross-sectional, prospective study, which followed the precepts established in the Code of Ethics for Research with Human Beings. It was therefore approved by the Research Ethics Committee of the Pontifícia Universidade Católica de São Paulo, under opinion no. 5,727,856. All patients who agreed to participate in the research signed the Informed Consent Form.

The research was carried out in a Specialized Center for Rehabilitation II (hearing and intellectual disabilities) in the city of São Paulo, affiliated with the SUS. The service receives, on average, 1000 new patients per year, of any age and region of the municipality, for audiological diagnosis, hearing aid provision and rehabilitation.

All patients seen at the Clinic are scheduled for regulated vacancies for multidisciplinary assessment in rehabilitation with a doctor, speech therapist and social worker to carry out all stages of the audiological diagnosis and adaptation of the hearing aid.

Upon completion of the initial stage of granting and adapting the hearing aid, patients over the age of 18 are advised by the team to return to the service when necessary, or at least once a year for periodic audiological monitoring, as described in the rehabilitation instruction auditory, physical, intellectual and visual of the Ministry of Health⁶. Scheduling must be done spontaneously by telephone or in person at the service secretariat.

Subjects

The research included subjects using hearing aids, over 18 years of age, who called or attended the service in person to request feedback for a



month. Everyone was instructed by the Clinic secretariat that their name and reason for requesting a return would be entered into a control spreadsheet for team analysis and scheduling as soon as possible. The subjects were selected by convenience sample, following the conditions:

All subjects over the age of 18 were included; users of hearing aids adapted at the University Clinic – CER II, whose names were registered by the secretariat on the return request sheet.

Users who, when contacted, reported that there was no longer a need for a consultation, or when it was impossible to contact them by telephone to schedule a return appointment, were excluded.

Variables were analyzed in the subjects according to the type and degree of hearing loss, classified according to the criteria of the World Health Organization/WHO (WHO, 2014)²⁴, using the quadrilateral average of the audiometric thresholds of the best ear of 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz.

The date of the last audiometry was recorded to characterize the time in which the last audiological evaluation was carried out. For the hearing aid age variable, the record of the date on which the patient received hearing aids at the service was used.

Material and procedures

Procedures carried out before the consultation resulted in appointments

Recording of phone calls made by clinic secretariat employees in a data spreadsheet. In total, six employees took turns each day and were instructed to write down the patient's name, date of birth, contact telephone number, complaint and date of the call. No specific guidance was given on how to describe the complaint.

At the end of one month, the spreadsheet was analyzed, and the medical records were collected to record the following data: the age of the hearing aid, the date of the last audiological evaluation and the date of the last consultation with the otorhinolaryngologist, which were added by the researcher to the database of data. The reasons for return were classified into categories pre-established by the researcher, in consensus with two other speech

therapists from the service, resulting in the following classification and procedures planned for the consultation:

- Follow-up (annual return for audiological monitoring) - 68 subjects - the procedures planned for each patient include: ENT consultation, audiological assessment, verification/adjustment of the hearing aid and mold and guidance for effective use of the hearing aid;
- Broken/lost hearing aids (replacement hearing aids or technical assistance) - 49 subjects – the age of the hearing aids was verified:
 - the lost hearing aid – patient referred for hearing aid replacement;
 - Age of the hearing aid over 36 months: expected procedures: checking the condition of the hearing aid to decide on the need for replacement;
 - Age of the hearing aid less than 36 months – expected procedures: checking the condition of the hearing aid: a) repair/maintenance by the speech therapist at the consultation; b) when it was under warranty, the subject was instructed to take it to technical assistance for cleaning and preventive maintenance; c) When it was not possible to carry out repairs in the service, the hearing aid was sent for maintenance by the service;
- HA adjustment - 37 subjects - expected procedures: adjustments and guidance;
- Ear mold adjustment - 17 subjects – expected procedures: creation of a new ear mold, adjustment of the mold and exchange of tubes;
- Medical report - 6 subjects – planned procedures: ENT consultation, audiological assessment and social service.

Appointments were made according to the availability of clinic professionals' schedules and the forecast of professionals needed in the care team. The teams were divided into two categories: simple team and full team:

- Simple team (ST): service provided by the service's speech therapy team. Procedures performed: hearing aid adjustments, checking the ear mold, changing the mold tubes, making a new ear mold, repair/maintenance by the au-

diologist during the consultation, referral of the hearing aid for technical assistance and guidance on the use and handling of hearing aids.

- Complete team (CT): care provided by an otorhinolaryngologist, speech therapy team and social services. Procedures performed: medical assessment, audiological assessment, hearing aid adjustments, hearing aid replacement, verification and creation of a new ear mold and guidance on the use and handling of hearing aids.

Procedures carried out during the consultation

At the beginning of the consultation, to detail the complaint already mentioned in the appointment, the speech therapist returned to the complaint, detailing the reason for returning to the service, thus defining the real demand and the conduct to be adopted.

If it was necessary to add procedures to the planned consultation, the subject was referred to the ES or EC professionals and necessary procedures on the same day or a return appointment was scheduled depending on availability and complexity of the procedure; and the procedures and conduct were recorded in a spreadsheet.

Analysis

Data was analyzed using Stata statistical software version 14.0 (Stata Corporation, College Station, TX). A descriptive univariate analysis was performed for all study variables and the bivariate analysis was performed with the intention of evaluating the differences between the types of teams (ES

or EC) and the characteristics of the population. The distribution of continuous variables was evaluated using the Shapiro-Wilk test in which, faced with a parametric distribution, bivariate analysis was performed. The ANOVA or Chi-square test was used, depending on the number of categories for each variable. When there was no normal distribution, differences were evaluated with the Mann Whitney non-parametric test. Variables with a p value = 0.20 in the bivariate analyzes were included in the “forward” multivariate modeling process. The two-tailed statistical significance established was $p \leq 0.05$. The associations between the dependent variable (type of team) and the independent variables were used using Poisson regression models. A sensitivity and specificity analysis were carried out and the predictive values were evaluated.

Results

The sample of this work consisted of 177 subjects. Of these, 59% (n=104) were female and 41% (n=73) were male. The average age of the subjects was 63 years old (SD 18 years old) with a minimum age of 18 years old and a maximum age of 98 years old.

There were 241 requests to schedule patients to return to the clinic for one month, with 64 of those entered by the secretariat in the spreadsheet not meeting the inclusion criteria.

Of the total number of subjects surveyed, 62% (n=110) were referred to the full team (CT) and 38% (n=67) to the simple team (ST) using the criteria reason for consultation, time since last audiometry and age of the device (Table 1).

Table 1. Sociodemographic characteristics according to type of professional conduct

Variables	Type of professional conduct			p Value
	Total Average (SD)	ST Average (SD)	CT Average (SD)	
Age (years)	62,84 (18,40)	63,37 (18,19)	62,50 (18,16)	0,60
Time of last audiometry (months)	21,49 (16,28)	14,22 (6,32)	25,92 (18,75)	<0,001
Age of hearing aid (months)	33,14 (22,08)	20 (14,51)	41 (22,25)	0,001

It can be observed that 67% of the subjects had sensorineural hearing loss (n=119), 25% mixed losses (n=44) and 1% (n=2) conductive losses. The remaining subjects, 7% (n=12), were placed in

Table 2 as having normal hearing, considering the thresholds of the better ear, as they had unilateral hearing losses of different degrees, according to the type of team.

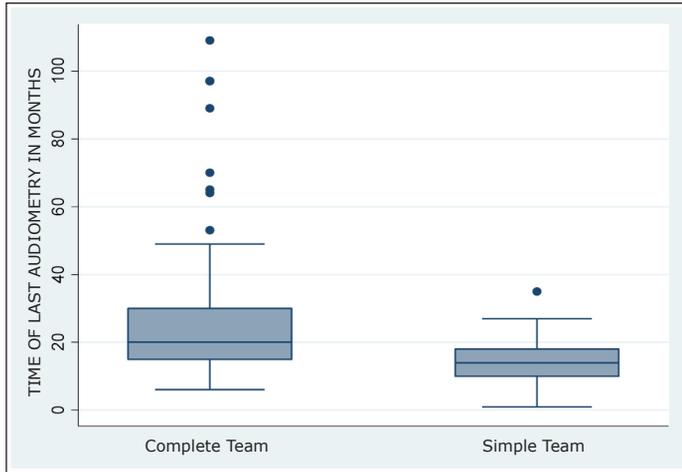
Table 2. Audiological characteristics according to the type of professional conduct

Variables	Tipo de conduta profissional			Valor p
	Total % (n)	ST % (n)	CT % (n)	
Gender				
Female	58,76 (104)	37,50 (39)	62,50 (65)	0,90
Male	41,24 (73)	38,36 (28)	61,64 (45)	
Degree of HL				
Normal	6,78 (12)	33,33 (4)	66,67 (8)	0,15
Mild	18,08 (32)	56,25 (18)	43,75 (14)	
Moderate	48,59 (86)	36,05 (31)	63,95 (55)	
Severe	18,64 (33)	33,33 (11)	66,67 (22)	
Profund	7,91 (14)	21,43 (3)	78,57 (11)	
Type of HL				
Normal/Unilateral	6,78 (12)	33,33 (4)	66,67 (8)	0,32
Sensory neural	67,23 (119)	36,64 (44)	63,03 (75)	
Mixed	24,86 (44)	38,64 (17)	61,36 (27)	
Conductive	1,13 (2)	100 (2)	0	

The time since the last audiometry was performed and the age of the hearing aid showed a difference of $p<0.001$ and $p=0.001$, respectively, in the analyses, determining the need for a specific team composition in the group in which the consultation was requested.

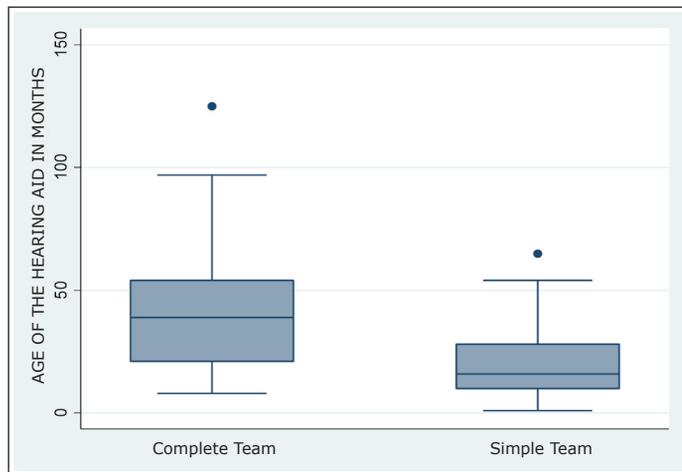
The subjects had, on average, less than two years since their last audiometry (21.5 months – $SD=16.26$). The minimum time was one month, and

the maximum was nine years (109 months). The average age of the hearing aids was less than three years (33.1 months), and the youngest hearing aid was one month old, the oldest just over ten years old (125 months). Figures 1 and 2 show the median time from the date of the last audiometry (TMAud) and the median time from hearing aid (TMAASI) according to the EC and ES care groups.



Legend: Complete Team - CT; Simple Team - ST

Figure 1. Median time from the last audiometry x type of team



Legend: Complete Team - CT; Simple Team - ST

Figure 2. Median time from hearing aid x type of team

In the figures, the subjects who required a CT had a longer time interval since the last audiometry was performed and were older than the patients who required the ST; this difference was statistically significant ($p < 0.001$).

Comparing the TMAud in relation to the age of the subjects, with no significant difference between the two groups, it was observed that patients aged 66 years or less had the exams carried out longer ago. This relationship was statistically significant ($p = 0.001$).

With the intention of evaluating which variables were involved in the teams' need for care (CT/ST), a multivariable analysis was carried out modeling variables that presented a value < 0.20 in the bivariate analysis. The final model is presented in Table 3. It is observed that for each average increase of one year in TMAASI, there is a 19% increase in the rate of need for EC care. The degree of loss had no significant relationship with the need for a full team.

Table 3. Variables associated with the use of a full team upon return

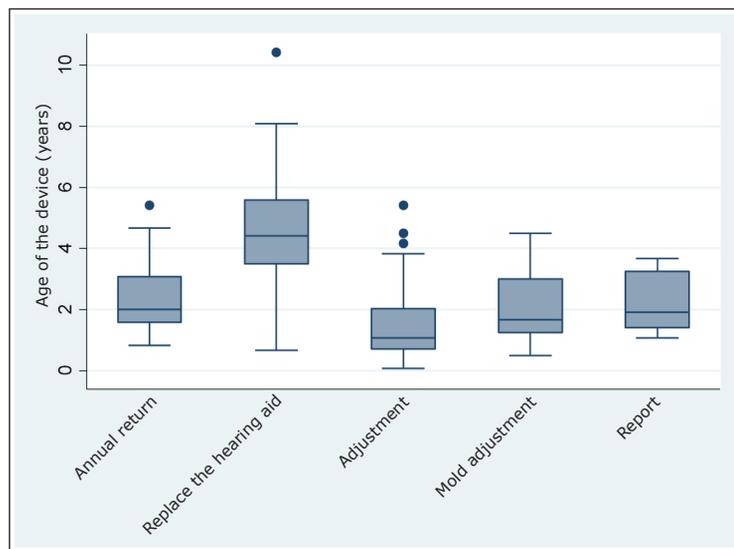
characteristics	Adjusted Model*		
	RT	CI 95%	P
Age of hearing aid (months)	1,14	1,08-1,22	<0,001
Degree of HL of the better ear			
Normal/Unilateral and Mild	Ref.		
Moderate	1,16	0,85-1,60	0,346
Severe and profound	1,28	0,92-1,78	0,144
Time of last audiometry (months)	1,05	0,98-1,12	0,140

*Model Adjusted by the time since the last audiometry and the degree of hearing loss in the best ear. RT: Rate ratio. 95% CI: 95% confidence interval; p: p-value; Ref: reference.

An analysis was carried out of the complaints noted by the secretariat when the patient called to request an appointment as a factor in predicting the composition and organization of the team and type of care required (ST/CT). The predominant complaint registered at the secretariat was an annual return (38.4%), and on the date of service, the predominant complaint was a broken or lost hearing aid (37.9%).

When analyzing the procedures and professional conduct performed on the date of the appointment, the earmold adjustment was the one that presented the lowest median (11.13 months) in relation to the time of the last audiometry.

It can be seen, in Figure 3, that for users in whom it was necessary to replace the hearing aid as professional conduct, the TMAASI was higher, median of 4.41 years, with a minimum and maximum of 0.67 and 10.42 years, respectively.



Source: Authors

Figure 3. TMAASI according to professional conduct

Discussion

This work sought to characterize hearing aid users who requested return to the reference service, identify the main complaints reported and verify

what information can be useful for scheduling to be carried out accurately, optimizing the number of vacancies and making professionals' schedules available. necessary for care, avoiding wasted time for the team and the patient.



177 subjects who requested return to the service during the month of August 2020 were analyzed. In relation to gender and age group, the results indicate a greater frequency of females and a greater number of elderly people. These findings are compatible with studies carried out in rehabilitation centers (CER) in other cities in Brazil, such as the study carried out in Salvador¹², which found 54.7% female and 64% elderly, and in the study carried out in Petrolina¹³, which found 55.3% female. The increase in the number of elderly people in Brazil has resulted in an increase in the use of health services by this population¹⁴ and health professionals must be prepared to serve this population¹⁵. In addition to having a longer life expectancy, the female population is more attentive to health and self-care¹⁶.

Regarding the type and degree of hearing loss, there was a predominance of the sensorineural type (67%) and moderate degree (48%). The same characteristics found when the population of this service was studied, demonstrating that this tends to be the population that makes the most use of amplification in terms of speech perception⁷.

Data from medical records regarding previous consultations indicate that the subjects had on average, 21.5 months since the last audiological evaluation. As established in the rehabilitation instructions for people with disabilities¹⁷, the hearing aid user must return to the service periodically for follow-up. There is concern about the reduction in the number of audiological follow-ups over time to the detriment of the number of hearing aid grants⁸. Coordination with all levels of care is essential so that individuals in need of care and guidance are identified, whether at the reference service or through the NASF and agents close to their residence.

In this study, we found that at the time of the subject's care, the most frequently reported complaint was a broken hearing aid, which corresponds to 37.85% (n=67) of the complaints, while the most adopted professional conduct was that of hearing aid replacement, 30.51% (n=54). In other words, some of those who reported that the hearing aid was broken required hearing aid replacement, and, for others, the problems were solved by maintaining the device. The average age of hearing aids that underwent hearing aid replacement was 4.41 years (53 months).

The data corroborates the studies carried out¹⁸ in 2019, which verified the reasons and average time for hearing aid replacement in users treated in the hearing health service of a hospital in the south of the country and found the average time between adaptation and replacement of 44.8 and 45.3 months in adults and the elderly, respectively, with the main reason for replacement being technical failure.

Considering that hearing aids are electronic equipment that require specialized technical assistance that guarantees durability and maintenance of acoustic quality, public policies must establish that companies that sell hearing aids and provide services to the SUS must provide a warranty term of at least one year. Furthermore, they must assure the user of the possibility of replacing the hearing aid in cases of technical failure of the hearing aid components, without the possibility of maintenance, theft, upon presentation of a police report and in the case of progressive hearing loss.

Hearing health services registered with the Ministry of Health and which grant hearing aids through the SUS must guarantee the hearing aid user the best possible use of their hearing residue, and, after the hearing aid adaptation process, are responsible for periodic monitoring, and audiological monitoring and the effectiveness of hearing aid use¹⁹. At the same time, establishing a user service network, linked to health issues at all levels of care, is essential so that the user can have access to the necessary service and continued use of the device, aiming for quality of life and social inclusion.

The service where this research was carried out, as it is a service within a university, constantly analyzes demand to propose solutions to better serve the population. Therefore, this research sets out to identify and classify the demand for hearing aid users to return to propose a solution, with the necessary and appropriate professionals for the immediate care of the subjects.

The characteristics of the patients influenced the decision to provide care based on the simple team - just with a speech therapist - and the complete team - with a doctor, speech therapist and social worker. Of the total number of subjects, 62% were scheduled with the CT and 38% with the ST, according to the complaint identified by the secretariat and the professional's analysis.

Subjects who required a full team had higher TMAud and TMAASI, compared to subjects who



required a simple team ($p < 0.001$). Older subjects, over 66 years of age, had a shorter period since the last audiometry ($p = 0.001$).

The hearing health service has had a great demand to serve the hearing aid user population, at the same time as there is a great demand from subjects who have not yet had access to the electronic device. This is one of the reasons that motivates the manager to know the profile of the population served to manage and plan his unit, as knowledge of the service demands guides the decisions and practices of the services provided¹².

Instead of the secretariat scheduling all patients with the ES, in 32% of cases there was the possibility of care only with the ES, which can optimize the use of vacancies and professional hours. This was very positive in the universe tested, of a queue being contained, enabling a more efficient schedule, avoiding the patient traveling long distances or creating a very busy service with more people than necessary.

The results of this research, more than the hypotheses presented, brought findings that assist in decision-making decisions, helping to optimize teams.

We conclude that the results of TMAud and TMAASI are decisive in the need for care to be composed of ST or CT. The secretariat's ability to access this information can help with future scheduling decisions.

The greater need for scheduling due to complaints of broken or lost hearing aids, leading to replacement of the device, does not presuppose that patients who did not seek care are well or do not require follow-up. Periodic monitoring of patients is important, as is research that can contribute to more efficient care for the population.

In another context, but also aiming for greater efficiency in the processes involved in monitoring, the role of teleconsultation in monitoring hearing aid users in hearing health services was analyzed. The results indicate that the stage of understanding the complaint can lead to its resolution or the determination of which face-to-face service is recommended for the user²⁰. A survey carried out²¹ of the most frequent complaints and how to resolve them suggests that listening to the complaint can lead to an individualized solution for each patient.

A service quality model was proposed that addresses three distinct components: structure, process and results. In the present study, issues relating

to processes were addressed. Quality management is directly related to routine management with the objective of improving results. To achieve this, it is necessary to train the team, organize tasks and control processes. The results of this research suggest that detailed analysis of the effectiveness and efficiency of processes can trigger changes in structure and benefit a greater number of users in an already overloaded system.

Conclusion

The date of the last audiometry and the age of the hearing aid were significant information in determining the type of team necessary to meet the patients' demands. These results suggest that, when carrying out scheduling by the secretariat, this information can be used in order to optimize and direct the type of scheduling to be carried out.

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