

Care integrality in adult hearing health service in the Unified Health System: access to rehabilitation

Integralidade do cuidado na atenção à saúde auditiva do adulto no SUS: acesso à reabilitação

Ingrid Helena Elizabeth Kolb Mazzarotto¹, Cláudia Giglio de Oliveira Gonçalves¹, Cintia Gonçalves de Lima Bellia¹, Cláudia Andriquetto Maoski Moretti¹, Milena Raquel Iantas¹

ABSTRACT

Purpose: To characterize the referral and analyze the perception of the users regarding the complaints and benefits of the use of hearing aids granted by the Unified Health System. **Methods:** A cross-sectional, quantitative study that analyzed 100 users of hearing aids in the initial visit after fitting, in a service of medium and high complexity in hearing health. Data were collected from the medical records and analyzed the characteristics of the hearing loss, the selection and fitting of hearing aids and the length of time using them. An interview was carried out to investigate the perception of complaints and benefits with the use of hearing aids. **Results:** Among the users of hearing aids, the age range of 66-90 years was predominant; schooling, incomplete middle school prevailed; mild to moderate sensorineural hearing loss, slight / discreet difficulty understanding speech; 184 prostheses were adapted, the majority of those were retroauricular and Type A; the waiting time between the referral and fitting was between 33-88 days, the main benefit of the hearing aid was the improvement of social understanding / interaction and the main complaint referred to problems of adjustment. **Conclusion:** Most users reported benefits with prosthesis use for speech comprehension and social interaction; the most mentioned complaint was adjustment.

Keywords: Hearing; Hearing loss; Hearing aids; Health programs and plans; Unified Health System

RESUMO

Objetivo: Caracterizar a indicação e analisar a percepção dos usuários quanto a queixas e benefícios do uso de próteses auditivas concedidas pelo Sistema Único de Saúde (SUS). **Métodos:** Estudo transversal, quantitativo, que analisou 100 usuários de próteses auditivas no retorno inicial após adaptação, em um serviço de média e alta complexidade em saúde auditiva. Foram coletados dados dos prontuários relativos às características da perda auditiva, da seleção e adaptação da prótese auditiva, e do tempo de uso. Foi realizada entrevista para investigar a percepção de queixas e benefícios com o uso da prótese auditiva. **Resultados:** Houve predomínio dos seguintes aspectos: a faixa etária de 66 a 90 anos; Ensino Fundamental incompleto; perda auditiva sensorineural de graus leve e moderado; ligeira/discreta dificuldade de compreensão da fala. Foram adaptadas 184 próteses, sendo a maioria retroauricular e de Tipo A; o tempo de espera entre a indicação e a adaptação foi entre 33 e 88 dias; o principal benefício da prótese auditiva foi a melhora da compreensão/interação social, e a queixa principal referiu-se a problemas de regulagem. **Conclusão:** A maior parte dos usuários relatou benefícios com a utilização da prótese para a compreensão de fala e a interação social, e a queixa mais referida foi a regulagem.

Palavras-chave: Audição; Perda auditiva; Auxiliares de audição; Planos e programas de saúde; Sistema Único de Saúde

Study carried out at Universidade Tuiuti do Paraná - Curitiba (PR), Brasil.

¹Programa Pós-graduação em Distúrbios da Comunicação, Universidade Tuiuti do Paraná – Curitiba (PR), Brasil.

Conflict of interests: No.

Authors' contribution: IHEKM participated in the study design, data collection, analysis and data interpretation, and article writing; CGOG participated in the study design, data analysis and interpretation, and article writing; CGLB, CAMM and MRI participated in data collection, analysis and interpretation and article writing.

Funding: None.

Corresponding author: Ingrid Helena Elizabeth Kolb Mazzarotto. E-mail: ingridmazzarotto@yahoo.com.br

Received: May 21, 2018; **Accepted:** November 05, 2018.

INTRODUCTION

In 2013, 6.2% of the Brazilian population had some kind of impairments, and hearing impairments would affect 1.1% of that population, according to data from the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística - IBGE)⁽¹⁾

Hearing loss entails impairments and psychosocial disadvantages, which may lead to social withdrawal and constraint of the quality of life^(2,3). In order to reduce such impacts, hearing aids are technological devices that may provide benefits when clinical or surgical treatment is not possible, having been used as primary therapeutics for several years⁽³⁾.

High number of hearing impaired individuals in Brazil, and the need to ensure their rights to health care, resulted in the implementation of the National Policy of Hearing Health Care (Política Nacional de Atenção à Saúde Auditiva - PNASA), regulation number 2.073, 2004⁽⁴⁾, currently replaced by regulation number 793, April 24, 2012⁽⁵⁾. Expanding that policy, State networks of hearing health care were implemented, responsible for integrated actions of hearing health promotion and hearing loss prevention, diagnosis, follow up and rehabilitation of the hearing impaired⁽⁵⁾.

Since the publication of PNASA, Brazilian citizens with hearing loss are granted hearing aids by the Unified Health System (Sistema Único de Saúde (SUS))⁽⁴⁾. However, complete assessment is required to determine the type and degree of the loss, which involves the otorhinolaryngologist's assessment as well as audiological screening, such as tonal audiometry, logaudiometry and the acoustic immittance testing, in addition to, in specific cases, the evoked otoacoustic emission testing and the brainstem auditory evoked potential (BAEP).

According to the Brazilian Hearing Health Guidelines⁽⁶⁾, concerning regulations from April 24, 2012 (Regulation 793)⁽⁵⁾ and from April 25, 2012 (Regulation 835)⁽⁷⁾, which specify the guidelines for granting hearing aids, the services authorized by the Ministry of Health must ensure users the best possible use of their residual hearing. Therefore, it is important to be considered, in the prosthesis choice, its features as well as individual needs regarding the electroacoustic specifications, the type of technology (type A, B and C), and the model of the hearing aids (behind the ear and in the ear)⁽⁶⁾.

According to the specifications by the legislation⁽⁶⁾, hearing aids must have minimum features, as follows:

- Type A: digital, two channels (independent adjustment for acoustic gain and output at a certain number of frequency ranges), manual or automatic volume control, non-linear signal processing, audio input for behind-the-ear hearing aids, noise reduction, active feedback manager without gain reduction, telephone coil (if there is space in the device), omni or directional microphone.
- Type B: with all the devices from type A, added by digital programming, four channels, two audio programs (manual and automatic), manual or automatic telephone coil, noise reduction and data logging.
- Type C: with all the devices from types A and B, added by six channels, three audio programs (manual or automatic)⁽⁶⁾.

Hearing health care legislation enabled users greater access to rehabilitation services. Study, which assessed PNASA, regarding hearing health service coverage and diagnosis procedures, between 2004 and 2011, evidenced a significant increase of 113% in service coverage, and 61% in medium and high complexity diagnostic procedures in hearing health⁽⁸⁾.

Despite better access for the hearing impaired to the Hearing Health Care Network and available technologies, it is necessary to consider the quality of such services, which encompasses users' satisfaction and service responsiveness⁽⁹⁾.

Users' satisfaction is based on their perceptions regarding expectations, values, and wishes about their health. As for the responsiveness, it refers to service performance, its response capacity to users' expectations on aspects beyond professional care, which includes: dignified and respectful service, compliance to confidentiality in the appointments, autonomy to choose treatments or professionals, efficient service, social support, facilities and infrastructure. The quality of health care must bring about users' adherence⁽⁹⁾.

Studies report that users' satisfaction with hearing aids continues being challenging for professionals, despite the technological advances. There are users' complaints on discomfort with loud environmental noises, speaking difficulties in noisy environment, and dissatisfaction with their self-image and the stigma of the hearing disability. However, other studies with adults report benefits referred by users⁽¹⁰⁻¹²⁾.

The Medium and High Complexity Service on Hearing Health, which performs hearing aid referral and fitting, must also be responsible for periodical follow-up of users, monitoring their hearing loss and effectiveness in the use of this type of technology. Thus, users younger than three years of age, follow-up must be performed up to four times a year, and for users older than three years of age, follow-up must be performed up to twice a year⁽⁶⁾.

A study assessed the performance and satisfaction of adult and elderly users of hearing aids, after a year of their fitting, evidencing that, most users considered satisfactory the use of hearing aids⁽¹¹⁾, despite a significant share of those reports moderate or high hearing difficulty.

Regarding the assessment of clinical procedures and quality of Hearing Health services, getting to know the perception of hearing aid users may help understand their feelings and needs, which may reflect on the service quality and humanization, in addition to being a way to evaluate service rendering to those individuals. Information on the benefit of hearing aids, by means of subjective assessments, is meaningful and important to validate amplification results, and may be included in clinical practice⁽¹¹⁾. Subjective, as well as objective evaluation, are relevant, and provide distinct information, which are complementary and equally necessary.

After those considerations, this study aimed to profile the referral, in addition to analyzing adult users' perception on the complaints and benefits in the use of hearing aids granted by SUS.

METHODS

It is a cross-sectional study, which analyzed users of hearing aids in their initial visit, after fitting, performed at a medium and high complexity service on hearing health (serviço de média e alta complexidade em saúde auditiva – SACSAs). SACSAs

delivers service to users from Curitiba and municipalities, corresponding to the first and sixth health care regions in Paraná State, Brazil, according to the rules established by the State Health Secretary of Paraná State, Brazil.

The study was approved by the Research Ethics Board under number 2.435.927, and all participants signed the Free Informed Consent Form.

As inclusion criteria for the study, were considered: (i) to be the first experience of wearing a hearing aid; (ii) to suffer from acquired, post-language hearing loss; (iii) to attend the first visit after fitting, which occurs between one and four months, according to appointment possibility; (iv) to have all patients' records duly filled out. As exclusion criteria: to be younger than 18 years of age, and not having signed the consent form in order to participate in the research. After the application of the inclusion and exclusion criteria, the sample comprised a total of 100 participants.

The participants were selected according to the service appointment agenda, reaching 100 participants, without previous gender definition, during researchers' available time for data collection.

Research participants had their hearing aids fitted between June, 2016 and March, 2017, consulting the speech-language pathologist. After that, their hearing aids were adjusted, molding and tubes were fitted and verified, and users received the hearing device manual and the required information on technical support and proper use of the prostheses.

Data from medical records were collected regarding participants' profile (age, gender, schooling), date of entrance in the service, characteristics of the hearing loss (audiometry, logaudiometry, Speech Recognition Percentage Index - SRPI), characteristics of the prosthesis selection and fitting (type and model), and time length of use. When attending the first visit after fitting, perception of complaints and benefits, related to the use of hearing aids, was investigated by means of a semi-structured interview, in which users were asked about the complaints/problems with the hearing aids, answers recorded for further analysis.

For data analysis, audiograms were classified according to the type⁽¹³⁾ and degree⁽¹⁴⁾ of the hearing loss and SRPI⁽¹⁵⁾ while level of difficulty in speech understanding. The recorded complaints and benefits were clustered in categories and quantified. Data were quantified and analyzed by means of statistical procedures, applying the Test of Difference in Proportions, significance level of 0.05 (5%).

RESULTS

The sample featured the following division by residence: municipalities of Curitiba (71%), União da Vitória (14%), Cruz Machado (5%), São Mateus do Sul (2%), Matinhos (2%), Morretes (2%), Guaratuba (2%), Antonina (1%) and Pontal do Paraná (1%).

Table 1 shows participants' profile (n=100) regarding schooling, age range and time length of hearing loss perception, separated by gender (50 females and 50 males).

The participants ranged 25 to 90 years old (mean of 69.90 years; Standard Deviation of 12 years). Prevalent age range was from 66 to 90 years old, being 62% males and 74% females.

Concerning schooling, it was evidenced illiterate participants, as well as participants having Higher Education, prevalence of incomplete Middle School (52% males and 56% females).

The beginning of the perception of hearing loss ranged from one year to over 10 years, greater frequency ranging from one to five years for both genders, 62% for males and 54% for females.

In Table 2, the characteristics of the hearing loss are described, type and degree of the loss, SRPI results by gender.

Concerning the type, degree and SRPI, greater frequency of sensorineural hearing loss, mild to moderate degree was observed, and slight/discrete difficulty in speech understanding, respectively. There were no significant differences, regarding gender, in the characteristics of hearing loss.

Table 3 shows the waiting time (in days) between the hearing aids referral and fitting, the time length between fitting and first follow-up visit, which indicate the service quality, and the characteristics of the adapted hearing aids. Significant

Table 1. Profile according to schooling, age range and time length of hearing loss perception (N = 100)

Variables	Males N = 50		Females N = 50		P	
	Absolute frequency	Relative frequency (%)	Absolute frequency	Relative frequency (%)		
SCHOOLING	Illiterate	1	2	3	6	NA
	Incomplete Middle School	26	52	28	56	0.6882
	Complete Middle School	4	8	6	12	NA
	Incomplete High School	7	14	0	0	NA
	Complete High School	8	16	10	20	0.6027
	Incomplete Higher Education	1	2	0	0	NA
AGE RANGE	Complete Higher Education	3	6	3	6	1.000
	25 to 65	19	38	13	26	0.1984
	66 to 90	31	62	37	74	0.1984
TIME LENGTH OF THE HEARING LOSS	1 to 5 years	31	62	27	54	0.4177
	6 to 10 years	7	14	12	24	0.2025
	over 10 years	9	18	8	16	0.7901
	Does not know	3	6	3	6	NA

Significant values ($p \leq 0.05$) – Test of Difference in Proportions

Subtitle: NA = Non-applicable

Table 2. Profile of hearing loss by gender and ear (N = 100)

		Gender						P	
		Male			Female			RE	LE
		RE	LE	Total	RE	LE	Total		
TYPE OF HEARING LOSS	Sensorineural	42	41	83 (83%)	37	37	74 (74%)	0.9196	0.3342
	Mixed	8	9	17 (17%)	12	12	24 (24%)	0.3173	0.4614
	Conductive	0	0	0	1	1	2 (2%)	NA	NA
DEGREE OF HEARING LOSS	Mild	22	20	42 (42%)	21	18	39 (39%)	0.6853	0.6803
	Moderate	20	22	42 (42%)	16	22	38 (38%)	0.4047	1.0000
	Moderately severe	8	7	15 (15%)	9	9	18 (18%)	0.7901	0.5854
	Severe	0	1	1 (1%)	4	1	5 (5%)	NA	NA
DIFFICULTY IN SPEECH UNDERSTANDING (SRPI)	No difficulties	13	15	18 (18%)	16	22	38 (38%)	0.5085	0.1471
	Slight/ discrete	19	20	39 (39%)	19	16	35 (35%)	1.0000	0.4047
	Moderate	13	11	24 (24%)	12	9	21 (21%)	0.5085	0.6171
	High	1	1	2(2%)	1	0	2 (2%)	NA	NA
	Probably incapable of following a conversation	4	3	7 (7%)	2	3	5 (5%)	NA	NA

*Significant values ($p \leq 0.05$) – Test of Difference in Proportions

Subtitle: RE = right ear; LE = left ear; NA = Non-applicable

Table 3. Features of hearing aids referral and fitting (N = 100)

Variables		Absolute frequency	Relative frequency (%)	P
TIME LENGTH BETWEEN REFERRAL AND FITTING (N = 100)	33 to 50 days	25	25	0.0000*
	51 to 70 days	57	57	
	71 to 88 days	18	18	
TIME LENGTH BETWEEN FITTING AND FIRST VISIT (N = 100)	27 to 60 days	29	29	0.5434
	61 to 90 days	38	38	
	91 to 122 days	33	33	
TYPE (N = 184)	TYPE A	138	75	0.0000*
	TYPE B	33	17.93	
	TYPE C	13	7.06	
MODEL (N = 184)	Behind the ear	174	94.56	0.0000*
	In the ear	10	5.43	
EAR FITTING (N = 184)	Both	84	84	0.0000*
	Right ear	8	8	
	Left ear	8	8	
TYPE OF MOLD (N = 174)	Mold	126	68.47	0.0000*
	Microtube	44	23.91	
	In-the-canal receiver	4	2.17	

Significant values ($p \leq 0.05$) – Test of Difference in Proportions

differences were obtained in relation to the waiting time between referral and hearing aid fitting, which ranged from 33 to 88 days (mean of 58 days), prevalent time length from 51 to 70 days. There were no significant differences regarding the time length between fitting and first follow-up visit, which ranged from 27 to 122 days (mean of 75 days).

A total of 184 hearing aids were fitted, being 84 bilateral fittings and 16 unilateral fittings (eight in the right ear, and eight in the left ear), being 94.56% behind-the-ear model, and 5.43% in-the-ear model, type A (75%), B (17.93%) and C (7.06%) technology. There were significant differences regarding the technology of the recommended hearing aids, Type A was prevalent, behind-the-ear model also prevailed, with canal molding, half loop and hollow shell, bilateral fitting.

From the total sample, 49% of the users reported benefits and complaints, 37% only reported benefits, and 14% of the users only reported complaints. As there was no gender difference between the complaints and benefits, the analysis was performed without gender distinction.

In Table 4, it is possible to observe the complaints (totaling 78), and benefits (totaling 112), grouped by categories, and some participants reported more than one complaint or benefit.

The complaints and benefits, collected by the interview, were reported by the participants and subsequently listed. Thus, the most reported complaint was related to the hearing-aid fitting (22%), concerning problems in gain adjustment. Other reports involved environmental noise (14%), molding discomfort (13%), difficulty in challenging listening settings (8%), itching

complaints, otorrhea, inflammation, dizziness (7%), difficulty in handling and re-insertion, occlusion effect (6%) and working problems (1%).

The most reported benefit was improvement in speech understanding and in social interaction (77%). Other benefits referred to improvement in the use of TV, radio or music (15%), tinnitus reduction (8%), use of the telephone (5%), improvement in general quality of life (4%), and listening to environmental sounds (3%).

Regarding weekly time length of use, 88 users reported to make regular use between 3 and 7 days a week. 12 participants, who stated not wearing the hearing aids, reported one or more of the following complaints: discomfort while wearing the

molding, difficulty in inserting the prosthesis, earache/otorrhea/headache/dizziness and adjustment problems.

Table 5 shows users who reported complaints and benefits regarding the weekly time length of use, technology, age range, gender, degree of the hearing loss, SRPI results.

There were significant differences considering the time length of use, with users, who wore their hearing aids from six to seven days a week, reporting more benefits than complaints ($p = 0.0022$). There were significant differences in speech understanding (SRPI result), evidencing that users with moderate hearing loss mentioned more complaints than benefits. No differences were observed among types A, B or C, age range, gender, degree of hearing loss.

Table 4. Complaints and benefits reported by users (N = 100)

Categories		Absolute Frequency	Relative Frequency (%)
COMPLAINTS	Adjustment (very low or high gain, very high sound)	22	22
	Environmental noise (wind noise)	14	14
	Mold discomfort	13	13
	Difficulty in challenging listening environment	8	8
	Clinical complaints (itching, otorrhea, inflammation, dizziness)	7	7
	Difficulty handling/inserting	7	7
	Occlusion sensation	6	6
	Working problems	1	1
BENEFÍTS	Improvement in speech understanding and social interaction	77	77
	Improvement in the use of TV/radio/music	15	15
	Improvement in the tinnitus	8	8
	Improvement in the use of telephones	5	5
	Improvement in the quality of life	4	4
	Improvement in listening to environmental sounds	3	3

Table 5. Relation between complaints/benefits and time length of use, technology, gender, age range and hearing loss

Variables		Benefits (112)		Complaints (78)		P
		n	(%)	N	(%)	
TIME LENGTH OF WEEKLY USE	Does not wear	3	2.67	15	19.23	NA
	Until 3 days	16	14.28	15	19.23	0.3636
	4 to 5 days	10	8.92	7	8.97	0.9905
	6 to 7 days	83	74.10	41	52.56	0.0022*
TECHNOLOGY	Type A	80	71.42	61	78.20	0.2934
	Type B	22	19.64	12	15.38	0.4511
	Type C	10	8.92	5	6.41	0.5278
AGE RANGE	25 to 65	31	27.67	23	29.48	0.7855
	66 to 90	81	72.32	55	70.51	0.7855
GÊNDER	Female	58	51.78	42	53.84	0.7797
	Male	54	48.21	36	46.15	0.7797
DEGREE OF LOSS (WORSE EAR)	Mild	35	31.24	19	24.35	0.3002
	Moderate	52	46.42	40	51.28	0.5096
	Moderately severe	20	17.85	18	23.07	0.3762
	Severe	5	4.46	1	1.28	NA
DIFFICULTY UNDERSTANDING SPEECH (SRPI) CONSIDERING THE WORSE EAR	None	26	23.21	16	20.51	0.6590
	Slight/discreet	45	40.17	25	32.05	0.2537
	Moderate	26	23.21	30	38.46	0.0233*
	Severe	2	1.78	2	2.56	NA
	Probably incapable of following a conversation	13	11.60	5	6.41	0.2294

*Significant values ($p \leq 0.05$) – Test of Difference in Proportions

Subtitle: NA = Non-applicable

DISCUSSION

The current study analyzed users of hearing aids from a Medium and High Complexity Hearing Health Service, who went to their first follow-up visit after device fitting.

There was gender similarity in the profile of the study sample, as 50% were males and 50% females out of 100 participants, while in another research from Santa Catarina State, Brazil, among 180 participants, females were prevalent (60%)⁽¹²⁾.

Users' prevalent age in the study sample was between 66 and 90 years of age, which can be justified by the fact that cases increase according to the age, that is, there is greater hearing impairment due to presbycusis, among other factors that may cause age-related hearing loss, such as diseases and accidents^(16,17). The current study included any type of hearing loss, disregarding the cause, once there are several factors that may affect hearing in that age range and impair speech discrimination.

Incomplete Middle School prevailed (52% among males and 56% among females). This profile corroborates a study with users from SUS in Brazil, which also found greater frequency of Middle School educational level (53.7%), being 51.8% among males, and 59.8% among females⁽¹⁸⁾. In an international study, held in the city of Ahvaz, Iran, with 40 hearing-aid users, ages between 66 and 86 years (mean of 74.62 years of age), prevalence of males, it was found that 90% were illiterate, 7.5% had High School level, and 2.5% had Higher Education⁽¹⁹⁾. The frequency of participants with lower educational level may be related to their age range.

Most users reported their perception of hearing loss between one and five years, no differences between genders. As it is a sample with age ranging between 66 and 90 years, progressive hearing loss along the years, justifies participants' search for hearing health services. Moreover, the high demand of patients results in waiting lists from Primary Health Care entry to their referral into a Medium and High Complexity Hearing Health Service.

No significant gender differences were observed regarding the type and degree of hearing loss, and SRPI result. Mild and moderate sensorineural hearing loss prevailed. Another study corroborates this finding, with moderate sensorineural hearing loss in aged populations⁽¹⁶⁾.

Time length between referral and hearing-aid fitting, that is, the period between the hearing-aid order to the supplier and its delivery, ranged from 33 to 88 days (mean of 58 days), prevalence from 51 to 70 days (Table 3), which can be considered satisfactory waiting time. Waiting time between referral and hearing-aid fitting depends on the supply of the hearing devices by four authorized companies.

The procedures to grant hearing aids to SUS users are authorized by the Health Secretary and operationalized by the Authorization Subsystem of High-Complexity/Cost Outpatient Procedures (Autorização de Procedimentos Ambulatoriais de Alta Complexidade/Custo (APAC-SAI), Joint Decree State Secretary/Ministry of Health/Secretary of Health Care n. 23, 05/21/2004, which provides the Authorization Module as the control instrument with information of authorizations⁽²⁰⁾. The authorization is valid for 90 days, and must be revalidated in case the hearing device is not delivered to the user within this period. In this study, waiting time between referral and fitting

of the hearing aids was inferior to the mentioned deadline, and there was no case that the APAC had to be revalidated due to delivery delay.

All hearing aids referred to in the current study were digital technology and their prescription complied with SUS regulations, Type A prevalence. That shows the service has met the recommendation of the Hearing Health Regulation, which states that 50% of the referrals must be provided with Type A devices⁽⁶⁾.

Most hearing aids (84%) had bilateral fitting. Similar data were found in research carried out in Curitiba, which studied 36 elderly people with age-related hearing loss, prevalence of bilateral fittings (69.44%)⁽²¹⁾. Another study, which assessed 200 users, males and females, mean age of 71.3 years, from a public health care service, found that 76.5% used bilateral hearing aids⁽²²⁾. Bilateral fitting must be chosen to unilateral one, as it brings more benefits to users, such as: (i) possibility of more adequate fitting, with balanced gain between the ears; (ii) sound source location and elimination of the head shadow effect; (iii) better speech understanding in noisy settings; (iv) reduction in the effect of hearing deprivation, among other benefits. However, there are cases which unilateral hearing aid fitting will show greater benefits, as in case of patient discomfort, manual dexterity problems and ear impairments, which prevent the use of bilateral fittings, such as surgeries or anatomical features^(6,23).

Higher amount of behind-the-ear (BTE) hearing aids with ear molds can be explained by the prevalent elderly age range, once the BTE model is easier to handle⁽²⁴⁾. In the current study, only 5.43% were in-the-canal (ITC) fittings, data also found in another study, which reports only one patient using this hearing-aid model⁽²⁴⁾. It is important to evaluate handling conditions, in order to avoid misuse and probable damages, and also facilitate users' autonomy for insertion and cleaning of their hearing aids.

Complaints about hearing prosthesis were less frequent in comparison to the perception of its benefits, and the most reported complaints referred to adjustment issues and molding discomfort. Research held with individuals between 60 and 86 years of age found, as complaints: (i) changes in the voice perception; (ii) difficulty in speech perception in noisy settings and on the phone; (iii) difficulties in hearing aid insertion and removal; (iv) molding discomfort⁽¹¹⁾. It is important that the algorithm adjustment and the hearing-aid prescription be adequate, being possible to readjust it for increasing adaptation. The correct selection, recommendation and fitting of the characteristics and components, for each patient, may determine the success of the process as a whole⁽²⁵⁾.

Other commonly reported complaints in literature are related to the use of the telephone and discomfort with background noises^(10,11,21,23,24,26). Those complaints were evidenced in the current research: discomfort with background noises (14%), and the benefit of using the telephone (5%). The recurrence of this kind of complaints in different studies suggests that there still have been technological shortcomings to be overcome, in addition to the importance of audiological follow-up for adjustments, guidance and monitoring of possible hearing disorders which require adjustments in the hearing aids. Besides, periodical follow-up enables seeing and guiding

users and family members, helping them take the most profit from the available technologies.

Regular users of hearing aids from 6 to 7 days a week observed greater benefits than complaints ($p = 0.0022$). Another study with 31 elders found significant relation between daily use of hearing devices and enhancement in the social interaction, evidencing that the more a patient wears his/her hearing aid, the better his/her communicative performance⁽²⁷⁾. This improvement can be related to the acclimatization effects, when progressive improvement in hearing skills occur, according to a study with 40 participants, between 28 and 78 years of age, with mild to moderately severe sensorineural hearing loss, which evidenced progressive improvement in speech understanding in quiet and noisy settings, after 14 days and three months of use⁽²⁸⁾.

In the analysis between complaints, benefits and SRPI results, participants with moderate speech impairment reported significantly more complaints than benefits ($p = 0.0233$). This is likely due to the adjustment phase to that new way of getting speech stimulus, as well as the need to associate strategies of communication which maximize the use of hearing aids, such as keeping proper distance and visual contact with the listener.

The limitations in the current study are the analysis of users from a single service and the data collection in the first follow-up visit. Thus, further cross-sectional and longitudinal studies are suggested to analyze the perception of benefits and complaints in the use of hearing aids at different intervals of time, also considering other variables, such as the etiology of the hearing loss, socioeconomic status and support network to users.

CONCLUSION

Most participants were elders, schooling ranging until incomplete Middle School level of education. Mild to moderate sensorineural hearing losses prevailed, with referral to hearing aids, behind-the-ears model with mold, type A and bilateral fitting. Mean waiting time between referral and hearing-aid fitting was considered satisfactory, based on PNASA. The greatest part of the users reported benefits with the use of the hearing device, regarding speech understanding and social interaction; on the other hand, the most reported complaint was related to the adjustment of the hearing aid gain. The participants with moderate speech impairments reported more complaints than benefits.

Periodical follow-up of the individuals with hearing-aid fitting is necessary, enabling not only to meet their needs, but also guidance and clearing of doubts to users and their family members, so that they can take the most profit from that technology, thus enhancing their quality of life.

REFERENCES

1. Brasil. IBGE: Instituto Brasileiro de Geografia e Estatística. Pesquisa nacional de saúde 2013. Percepção do estado de saúde, estilos de vida e doenças crônicas [Internet]. Rio de Janeiro: IBGE; 2014 [citado 2018 Maio 21]. 181 p. Disponível em: <ftp://ftp.ibge.gov.br/PNS/2013/pns2013.pdf>
2. OMS: Organização Mundial de Saúde. Deafness and hearing loss [Internet]. 2018 [citado 2018 Mar 15]; Disponível em: <http://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss>
3. Pacala JT, Yueh B. Hearing deficits in the older patient: "I didn't notice anything". *JAMA*. 2012;307(11):1185-94. <http://dx.doi.org/10.1001/jama.2012.305>. PMID:22436959.
4. Brasil. Ministério da Saúde. Portaria GM/MS nº 2.073, de 28 de setembro de 2004. Institui a política nacional de atenção à saúde auditiva. Diário Oficial da União [Internet]; Brasília; 28 set 2004 [citado 2018 Maio 21]. Disponível em: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2004/prt2073_28_09_2004.html
5. Brasil. Ministério da Saúde. Portaria GM/MS nº 793, de 24 de abril de 2012. Institui a rede de cuidados à pessoa com deficiência no âmbito do Sistema Único de Saúde. Diário Oficial da União [Internet]; Brasília; 25 abr 2012 [citado 2018 Maio 21]. Disponível em: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2012/prt0793_24_04_2012.html
6. Instrutivo Saúde Auditiva. Referentes às Portarias GM/MS 793 de 24 de abril de 2012 e Portaria GM 835 de 25 de abril de 2012. Diretrizes para tratamento e reabilitação/habilitação de pessoas com deficiência auditiva. Diário Oficial da União [Internet]; Brasília; 24 abr 2012 [citado 2018 Maio 21]. Disponível em: http://www.saude.sp.gov.br/resources/ses/perfil/gestor/homepage/redesãregionais-de-atencao-a-saude-no-estado-de-sao-paulo/rede-de-cuidados-a-pessoa-com-deficiencia/documentos/instrutivo_auditivo_1107.pdf
7. Brasil. Ministério da Saúde. Portaria GM/MS nº 835 de 25 de abril de 2012. Institui incentivos financeiros de investimento e de custeio para o Componente Atenção Especializada da Rede de Cuidados à Pessoa com Deficiência no âmbito do Sistema Único de Saúde. Diário Oficial da União [Internet]; Brasília; 26 abr 2012 [citado 2018 Maio 21]. Disponível em: http://www.lex.com.br/legis_23254690_PORTARIA_N_835_DE_25_DE_ABRIL_DE_2012.aspx
8. Silva LSG, Gonçalves CGO, Soares VMN. National policy on healthcare hearing: an evaluative study from covering services and diagnostic procedures. *CoDAS*. 2014;26(3):241-7. <http://dx.doi.org/10.1590/2317-1782/201420140440>. PMID:25118922.
9. Comes Y, Trindade JS, Shimizu HE, Hamann EM, Bargioni F, Ramirez L, Sanchez MN, Santos LM. Evaluation of user satisfaction and service responsiveness in municipalities enrolled in the Mais Médicos (More Doctors). Program. *Cienc Saude Colet*. 2016;21(9):2749-59. <http://dx.doi.org/10.1590/1413-81232015219.16202016>. PMID:27653060.
10. Lopes AS, Costa MJ, Aurélio NHS, Santos SN, Vaucher AV. Satisfaction and performance of hearing aids users assisted in a hearing health care program. *Rev CEFAC*. 2011;13(4):698-709. <http://dx.doi.org/10.1590/S1516-18462011005000005>.
11. Fialho IDM, Bortoli D, Mendonça GG, Pagnosim DF, Scholze ADS. Elderly perception on the use of hearing aids given by the health system (SUS). *Rev CEFAC*. 2009;11(2):338-44. <http://dx.doi.org/10.1590/S1516-18462009000200020>.
12. Dell'Antônia SF, Ikino CMY, Carreirão Filho W Fo. Degree of satisfaction of patients fitted with hearing aids at a high complexity service. *Rev Bras Otorrinolaringol*. 2013;79(5):555-63. <http://dx.doi.org/10.5935/1808-8694.20130100>. PMID:24141668.
13. Silman S, Silverman CA. Basic audiologic testing. In Silman S, Silverman CA. *Auditory diagnosis: principles and applications*. San Diego: Singular Publishing Group; 1997. p. 44-52.
14. Lloyd LL, Kaplan H. *Audiometric interpretation: a manual o basic audiometry*. Baltimore: University Park Press; 1978.

15. Jerger J, Speacks C, Trammell JL. A new approach to speech audiometry. *J Speech Hear Disord.* 1968;33(4):318-28. <http://dx.doi.org/10.1044/jshd.3304.318>. PMID:5696322.
16. Rodrigues CCC, Aurélio FS, Silva VB, Lopes TA. Benefício fornecido pelo uso de aparelhos de amplificação sonora individual em idosos de um programa de saúde auditiva de Porto Velho - RO. *Rev CEFAC.* 2013;15(5):1516-8. <http://dx.doi.org/10.1590/S1516-18462013005000025>.
17. Paiva KM, Cesar CLG, Alves MCGP, Barros MBA, Carandina L, Goldbaum M. Envelhecimento e deficiência auditiva referida: um estudo de base populacional. *Cad Saude Publica.* 2011;27(7):1292-300. <http://dx.doi.org/10.1590/S0102-311X2011000700005>. PMID:21808814.
18. Guibu IA, Moraes JC, Guerra AA Jr, Costa EA, Acurcio FA, Costa KS, Karnikowski MGO, Soeiro OM, Leite SN, Álvares J. Características principais dos usuários dos serviços de atenção primária à saúde no Brasil. *Rev Saude Publica.* 2017;51(2):17s. PMID:29160451.
19. Dashti R, Khiavi FF, Sameni SJ, Bayat A. Satisfaction with hearing aids among aged patients with different degrees of hearing loss and length of daily use. *J Audiol Otol.* 2015;19(1):14-9. <http://dx.doi.org/10.7874/jao.2015.19.1.14>. PMID:26185786.
20. Brasil. Secretaria Executiva. Portaria Conjunta SE/MS/SAS nº 23, de 21 de maio de 2004. Disponibiliza o Módulo autorizador para os gestores locais. *Diário Oficial da União [Internet]; Brasília; 25 mai 2004 [citado 2018 Maio 21].* Disponível em: <https://www.legisweb.com.br/legislacao/?id=189755>
21. Ribas A, Kozlowski L, Almeida G, Marques JM, Silvestre RAA. Qualidade de vida: comparando resultados em idosos com e sem presbiacusia. *Rev Bras Geriatria Gerontol.* 2014;17(2):353-62. <http://dx.doi.org/10.1590/S1809-98232014000200012>.
22. Iwahashi JH, Jardim IS, Bento RF. Results of hearing aids use dispensed by a publicly-funded health service. *Braz J Otorhinolaryngol.* 2013;79(6):681-7. <http://dx.doi.org/10.5935/1808-8694.20130126>. PMID:24474478.
23. Azevedo MM, Vaucher AVA, Duarte MT, Biaggio EPV, Costa MJ. Interferência Binaural no Processo de Seleção e Adaptação de Próteses Auditivas: revisão sistemática. *Rev CEFAC.* 2013;15(6):1672-8. <http://dx.doi.org/10.1590/S1516-18462013000600031>.
24. Moda I, Mantello EB, Reis ACMB, Isaac MDL, Oliveira AA, Hyppolito MA. Avaliação da satisfação do usuário de aparelho de amplificação sonora. *Rev CEFAC.* 2013;15(4):778-85. <http://dx.doi.org/10.1590/S1516-18462013000400006>.
25. Teixeira AR, Garcez V. Aparelho de amplificação sonora nindividual componentes e características eletroacusticas. In Boéchat EM, Menezes PL, Couto CM, Frizzo ACF, Scharlach RC, Anastasio ART, organizadores. *Tratado de audiologia.* 2. ed. Rio de Janeiro: Guanabara Koogan; 2015. p. 253-258.
26. Paiva KM, Maciel PMA, Cintra LG. Compreendendo o idoso usuário de próteses auditivas. *Ciênc Saúde Coletiva.* 2011;16(6):2927-34. <http://dx.doi.org/10.1590/S1413-81232011000600030>.
27. Miranda EC, Calais LL, Vieira EP, Carvalho LMA, Borges ACLC, Iorio MCM. Dificuldades e benefícios com o uso de prótese auditiva: percepção do idoso e sua família. *Rev Soc Bras Fonoaudiol.* 2008;13(2):166-72. <http://dx.doi.org/10.1590/S1516-80342008000200011>.
28. Santos SN, Petry T, Costa MJ. Acclimatization effect in speech recognition: evaluation without hearing aids. *Pro Fono.* 2010;22(4):543-8. <http://dx.doi.org/10.1590/S0104-56872010000400031>. PMID:21271114.