

Low adherence to hearing rehabilitation: causes and impact on the satisfaction of users of a public service in southern Brazil

Baixa adesão à reabilitação auditiva: causas e impacto na satisfação de usuários de um serviço público no sul do Brasil

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ABSTRACT

Purpose: To investigate the reasons for low adherence to treatment with hearing aids among adults and older adults attended in a public service in the Southern Region of Brazil, and to verify whether there is an association with sociodemographic and contextual variables, as well as to examine the relationship with the level of satisfaction with amplification among these individuals. **Methods:** A total of 201 hearing aid users participated, all with devices in good working condition and an average daily use (datalogging) of less than eight hours per day. Sociodemographic and contextual information was collected through oral interviews and review of medical records. Satisfaction with hearing aid use was assessed using the Satisfaction With Amplification in Daily Life questionnaire. **Results:** Reduced perception of hearing-related disadvantages was the most frequent reason for insufficient device use (17.9%), especially among users with less than three hours of daily use. Concerning technical factors, fear of damaging the device (16.6%) was the most frequently reported, particularly among those who used the devices between three and six hours per day. Emotional issues were more frequently reported by women ($p = 0.008$), whereas fear of damaging the device was more prevalent among men (38.46%; $p = 0.010$) and was associated with occupation ($p = 0.044$). Overall and subscale scores indicated high satisfaction with hearing aids. **Conclusion:** The most common reasons for low hearing aid use were reduced perception of hearing-related disadvantages and fear of damaging the device, which were associated with sex and occupation. Despite these barriers, users reported overall satisfaction with the device.

Keywords: Hearing aids; Treatment adherence and compliance; Patient satisfaction; Hearing loss; Social stigma

RESUMO

Objetivo: Investigar os motivos de baixa adesão ao tratamento com aparelho de amplificação sonora individual por adultos e idosos atendidos em um serviço público da Região Sul do Brasil e verificar se há relação com variáveis sociodemográficas e contextuais, além de relacionar com o nível de satisfação desses sujeitos com a amplificação sonora. **Métodos:** Participaram 201 usuários de aparelhos auditivos com o dispositivo em boas condições de uso, tempo de uso médio diário (*datalogging*) inferior a oito horas por dia. As informações sociodemográficas e contextuais foram coletadas por meio de entrevista oral e acesso aos prontuários. Para avaliar a satisfação com o uso dos aparelhos, foi realizada a aplicação do questionário *Satisfaction With Amplification In Daily Life*. **Resultados:** A percepção reduzida das desvantagens auditivas foi o motivo mais frequente para o uso insuficiente dos aparelhos (17,9%), sobretudo entre usuários com menos de três horas diárias de uso. Entre os fatores técnicos, o medo de danificar o dispositivo (16,6%) foi o mais citado, predominando entre aqueles que utilizavam os aparelhos de três a seis horas por dia. Questões emocionais foram mais mencionadas por mulheres ($p=0,008$), enquanto o receio de danificar o aparelho foi mais prevalente entre homens (38,46%; $p=0,010$) e apresentou associação com a ocupação ($p=0,044$). Os escores globais e das subescalas indicaram alta satisfação com os aparelhos de amplificação sonora individual. **Conclusão:** Os motivos mais comuns para a baixa utilização dos aparelhos auditivos foram a percepção reduzida das desvantagens auditivas e o medo de danificá-los, associado ao sexo e à ocupação. Apesar dessas barreiras, os usuários relataram satisfação geral com os dispositivos.

Palavras-chave: Auxiliares de audição; Cooperação e adesão ao tratamento; Satisfação do paciente; Perda auditiva; Estigma social

Study carried out at Universidade Federal de Santa Maria – UFSM – Santa Maria (RS), Brasil.

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Conflict of interests: No.

Authors' contribution: BLSS collected the data and wrote the article; RL reviewed the manuscript; FSAP conducted the study, provided guidance, assistance, and reviewed the manuscript.

Data Availability Statement: Research data is available in the body of the article.

Funding: None.

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Received: September 27, 2025; **Accepted:** March 15, 2026

Editor-in-Chief: Maria Cecília Martinelli Iorio.

Associate Editor: Isabela Hoffmeister Menegotto.

INTRODUCTION

Hearing is one of the fundamental senses for the development and maintenance of human communication, in the development of speech and language. According to the World Health Organization (WHO)⁽¹⁾, one in four people will live with some degree of hearing loss by 2050.

Hearing loss is considered the greatest modifiable risk factor for cognitive decline, accounting for up to 9% of all new cases of dementia⁽²⁾. In addition, hearing loss is also associated with increased depressive symptoms, which are linked to issues of social isolation and withdrawal from occupational activities, compromising quality of life⁽³⁾.

Hearing aids (HA) are the most common rehabilitation strategy for treating hearing loss⁽⁴⁾. In addition to improving individuals' communication and reducing the impacts of hearing loss, these devices also contribute to improving quality of life and increasing the user's social participation in their environment⁽⁵⁾.

A study conducted in a public health service observed that 13% of users did not adhere to treatment, a rate higher than that recorded in other countries, such as Australia (3%)⁽⁶⁾. Furthermore, another study⁽⁷⁾ highlights the underutilization of hearing aids, explained by several factors, including sound quality, social stigmas and sociodemographic issues that hinder the effective implementation of treatment for hearing loss.

In Brazil, since 2005, these devices, which have high value, have been provided free of charge to users through hearing health services accredited by the Ministry of Health⁽⁸⁾ after the publication of Ordinance No. 387⁽⁹⁾.

Considering that hearing aids offered by hearing health programs accredited by the Brazilian Unified Health System (SUS) are funded with public resources, the non-use of these devices generates additional costs for the system. Therefore, identifying the factors associated with the low use of these devices is a fundamental step in developing strategies to improve the hearing rehabilitation process.

The public health service in which this study was conducted is a hearing rehabilitation program that operates in accordance with the guidelines, instructions, and ordinances of the Ministry of Health within the scope of public hearing rehabilitation policies⁽¹⁰⁾. The program follows a structured flowchart, beginning with the first consultation, dedicated to anamnesis, hearing assessment, and pre-molding. The second consultation is for testing with three different amplification devices, while the third covers the adaptation of the selected devices, guidance, and counseling to the user. The fourth consultation corresponds to the patient's first return visit, carried out 30 days after the adaptation of the hearing aids. Subsequently, follow-up is continuous, carried out annually or whenever necessary, ensuring adequate monitoring and support, as well as counseling in accessible language, at all user return visits.

The program follows a structured flowchart, beginning with the first consultation, dedicated to anamnesis, hearing assessment, and pre-molding. The second consultation is for testing with three different hearing aids, while the third covers the fitting of the selected devices, guidance, and counseling for the user. The fourth consultation corresponds to the patient's first follow-up appointment, held 30 days after the hearing aid fitting. Subsequently, follow-up is continuous, carried out annually or whenever necessary, ensuring adequate monitoring

and support, as well as counseling in accessible language, at all user follow-up appointments.

This study is justified by the need to investigate the reasons for low adherence to the use of adapted hearing aids in a public health service, aiming to identify barriers that may be related to individual factors (stigma, difficulty in handling and acquiring batteries), technical factors (inadequate adjustments and adaptations), or institutional factors (lack of follow-up or insufficient guidance), and thus formulate strategies to ensure that government investments result in positive impacts on hearing health, quality of life, and increased productivity of the beneficiary population.

Therefore, the objective of this study was to investigate the reasons for low adherence to treatment with individual hearing aids among adults and elderly people treated in a public hearing health care service in the Southern Region of Brazil, and to analyze its relationship with the duration of use and sociodemographic and contextual variables, as well as to verify the level of satisfaction of these subjects with hearing aids.

METHODS

This is a quantitative, cross-sectional, and descriptive study, conducted at the Hearing Health Care Service in the municipality of Santa Maria (RS), which serves the 4th and 10th Regional Health Coordination areas of the state of Rio Grande do Sul. This service is developed within the Speech Therapy Service of the Federal University of Santa Maria.

Data collection took place between April and December 2024. The study was approved by the Research Ethics Committee of the aforementioned institution, under number 6.114.492. All participants agreed to participate in the research and signed the Informed Consent Form (ICF).

The eligibility criteria for this research were: hearing aid users, both new and experienced, attending the aforementioned service, over 18 years of age, possessing devices in good working condition and exhibiting low adherence to treatment with an average daily usage time (datalogging) of less than eight hours per day. Individuals with difficulties in oral, receptive and/or expressive communication that would prevent participation in the research were excluded.

Hearing aid users attended the service for follow-up appointments with the speech-language pathologists in the sector, who were partners in this research. During this appointment, an analysis of the physical and acoustic condition of the devices was performed, and the data logging was verified in the corresponding software. After this evaluation, along with the application of the other established eligibility criteria, the speech-language pathologists referred the participants who met the requirements to the data collection phase of the study.

According to the eligibility criteria, the study comprised 201 individuals, residents of the municipalities that make up the 4th and 11th Regional Health Coordination areas of the state of Rio Grande do Sul, users of hearing aids, with a mean age of 68 years and 8 months (SD = 14 years and 5 months), of both sexes, with the majority being male ($n = 117$; 58.2%; $p = 0.015$). Furthermore, more than half of the sample had not completed elementary school ($n = 131$; 65.2%), were retired ($n = 126$; 62.7%), had corrected impaired visual acuity ($n = 128$; 63.7%), and traveled to the service using municipal transportation ($n = 108$; 53.7%).

Regarding audiological findings⁽¹¹⁾, most of the sample had moderate (RE: n=164; 81.6%; LE: n=165; 82.1%) or moderately severe (RE: n=68; 33.8%; LE: n=67; 33.3%) sensorineural hearing loss. Concerning the average time users had been using hearing aids, 38.8% (n=78) had been using them for less than a year, 46.3% (n=93) had been using hearing aids for between one and ten years, and 14.9% (n=30) had been using the device for more than ten years. The average daily usage time for participants was 3.84 hours/day in the right ear (RE) and 3.85 hours/day in the left ear (LE).

Regarding the hearing aid model used, the majority of users (82.6%; n=166) used behind-the-ear (BTE) devices fitted with a mold. Concerning the technology employed in the devices, 58.7% (n=118) were type B, corresponding to intermediate technology models; 31.3% (n=63) were type C, models that include devices with a greater number of features; and 8.5% (n=17) were type A, more basic devices with fewer available features. In 1.5% (n=3) of cases, no information was available about the technology used. Regarding the prescriptive rule adopted, it was observed that the majority of participants (92.5%; n=186) used the NAL-NL2 method (National Acoustic Laboratories - Non-Linear 2), recognized for its clinical validation.

Data collection was conducted through individual interviews with participants and analysis of their respective medical records.

Sociodemographic and contextual data were collected from oral interviews, in which information was requested about the city of origin, family composition, modes of transportation to the service, educational level, current occupation, and average monthly income. Information related to the audiological findings of each subject and data related to the adaptation of the hearing aid were collected from the users' individual medical records.

The data collection regarding the reasons for non-adherence was carried out through the application of a data collection form developed by the researchers, which listed several reasons, among which the subject could select more than one option. The alternatives included: low sound quality, embarrassment about using it (aesthetics, prejudice), difficulty with manual dexterity, low visual acuity, difficulty changing batteries, saving batteries, emotional issues, fear of damaging the device, lack of understanding about the need for its use, and lack of awareness of the disadvantages imposed by hearing loss. In addition, there was an "other" option, in which the individual could report other reasons for not effectively using the devices.

Next, the individuals were subjected to the application of the *Satisfaction With Amplification In Daily Life* (SADL) questionnaire⁽¹²⁾, an instrument used to assess the satisfaction of hearing aid users, containing 15 questions that should be answered according to the visual analog scale. Of the 15 items presented, in 11, the score given by the individuals coincides with the scoring scale, with score 1 being "not at all", 2 "somewhat", 3 "somewhat", 4 "more or less", 5 "considerably", 6 "very" and 7 "very much" satisfied. In the other four items (questions 2, 4, 7 and 13) there is an inverse relationship between the score and the scale, that is, the classification "not at all" receives 7 points and expresses greater satisfaction and the classification "very much" receives 1 point, indicating dissatisfaction.

The questionnaire features four subscales, in addition to the overall score, namely: positive effect, negative factors, services and cost, and personal image. Individuals responded using a visual scale sheet⁽¹³⁾, which presented representative figures for the seven response levels, aiming to facilitate understanding by the participants.

For the analysis of the degree of satisfaction, the standards established by the authors of the questionnaire were adopted⁽¹²⁾, namely: scores below the 20th percentile indicate dissatisfaction on the part of the users; scores between the 20th and 80th percentile suggest that the users are satisfied with the amplification; scores above the 80th percentile show a high level of satisfaction of the subjects with the use of the amplification.

The collection of sociodemographic and contextual data, as well as information on the reasons for low participation and the satisfaction questionnaire, was carried out by the researchers in quiet rooms, in an impartial manner, with a clear and objective oral presentation. This procedure aimed to ensure the participants' understanding, minimizing possible influences of educational level or reading ability on the responses and thus ensuring higher quality data.

The compiled data were tabulated and subjected to statistical tests. To investigate the association between daily usage time and the causes of low hearing aid use, the sample was organized according to the datalogging into: [0, 3] hours of use/day; [3, 6] hours of use/day and [6, 8] hours of use/day. Subsequently, K-Means cluster analysis and Chi-square statistical association tests were applied to verify if certain reasons for non-use of the device showed a statistically significant relationship with the usage ranges. In order to analyze the frequency and association of reasons for low adherence to the use of hearing aids with sociodemographic and contextual variables, Cramer's V test, the likelihood ratio test, and the Z-test were applied. McNemar's test, with Bonferroni correction, was used to analyze the proportion of different reasons that justified the underutilization of hearing aids. To assess the relationship between the stated reasons for low device usage and the results of the SADL satisfaction questionnaire, Kendall's non-parametric Tau-b correlation coefficient and percent coefficients of variation were applied.

RESULTS

Among the reasons reported by participants for low adherence to the auditory rehabilitation process through the selection and adaptation of hearing aids, it was found that the reduced perception of auditory disadvantages resulting from hearing loss was the main individual reason, being associated with low usage time (group with usage time less than three hours per day). This factor refers to the individual's difficulty in recognizing the functional impairments of the loss, which contributes to the non-continuous and inconsistent use of the devices. Other recurring personal reasons, also associated with very low usage time [0.3] of the devices, were shame about using the devices and emotional issues (Tables 1 and 2).

Among the technical reasons, the most frequently mentioned was the fear of damaging the device, also associated with usage time, being more evident in the group that used the amplification devices for three to six hours a day (Tables 1 and 2). Another recurring reason for non-use, also associated with usage time, was the lack of clarification related to the shorter daily usage time [0, 3]. Low sound quality was also frequently mentioned and showed a tendency towards significance in association with very short usage time [0, 3] (Tables 1 and 2).

When investigating the association between the reasons for low use of hearing aids and sociodemographic and contextual variables, a strong relationship was found between the perception of low sound quality and the municipality of residence of the

Table 1. Frequency of reported reasons for low device usage according to categories

Categories	Reasons for the low use of IHA	N(%)	RL			LE		
			[0, 3]	[3, 6]	[6, 8]	[0, 3]	[3, 6]	[6, 8]
			%	%	%	%	%	%
Individual Reasons	Low awareness of hearing disadvantages	17.9	20.9	17.0	14.4	20.8	16.7	14.9
	Shameful to use	2.9	5.4	2.1	0.0	5.2	2.2	0.0
	Emotional issues	3.4	6.8	1.4	1.1	7.1	0.7	1.1
	Use only for activities you deem necessary	5.8	3.4	6.4	8.9	3.2	5.8	10.3
	Battery saving	6.1	5.4	6.4	6.7	6.5	6.5	4.6
	No access to batteries	1.8	2.0	0.7	3.3	1.9	1.4	2.3
	Ear diseases	2.1	2.0	2.1	2.2	0.6	2.2	4.6
	Extra-auditory complaints	1.8	0.7	3.5	1.1	0.6	2.9	2.3
	Low visual acuity	1.3	1.4	0.7	2.2	1.3	0.7	2.3
	Impossibility of use	1.1	1.4	1.4	0.0	1.3	1.4	0.0
	Not feeling any benefit from hearing aids	0.3	0.7	0.0	0.0	0.6	0.0	0.0
Technical reasons	Physical complaints	6.9	5.4	7.8	7.8	6.5	8.7	4.6
	Fear of damaging the device(s)	16.6	13.5	20.6	15.6	13.0	21.0	16.1
	Low sound quality	12.1	10.8	13.5	12.2	11.0	13.8	11.5
	Manual difficulty	4.5	5.4	2.8	5.6	4.5	4.3	4.6
	Poor hygiene / problems with the mold or tube	4.5	3.4	3.5	7.8	3.2	2.9	9.2
	Difficulty changing the batteries	1.8	2.0	1.4	2.2	1.3	2.2	2.3
Others	Microphony	1.6	0.7	1.4	3.3	1.9	0.7	2.3
	Climate issues	4.5	4.1	4.3	5.6	3.9	4.3	5.7
	Little clarification	2.6	4.1	2.8	0.0	4.5	1.4	1.1
	Other reasons	0.3	0.7	0.0	0.0	0.6	0.0	0.0

Subtitle: N = absolute number; % = percentage; RE = right ear; LE = left ear; IHA = individual hearing aid

Table 2. Association between reasons for low usage and different groups according to usage time

Categories	REASON FOR NON-USE	CHI-SQUARE VALUE	P value	PREDOMINANT USAGE RANGE (h/day)
Individual Reasons	Low awareness of hearing disadvantages	15.19	< 0.001*	[0, 3)
	Shameful to use	17.82	< 0.001*	[0, 3)
	Emotional issues	26.38	0.000*	[0, 3)
	Use only for activities you deem necessary	2.23	0.328	[3, 6)
	Battery saving	2.78	0.249	[0, 3)
	No access to batteries	1.00	0.606	[0, 3)
	Ear diseases	0.50	0.779	[3, 6)
	Extra-auditory complaints	6.14	0.046	[3, 6)
	Low visual acuity	0.64	0.728	[0, 3)
	Impossibility of use	4.0	0.135	[0, 3)
	Not feeling any benefit from IHA	4.0	0.135	[0, 3)
Technical reasons	Physical complaints	4.19	0.123	[3, 6)
	Fear of damaging the device(s)	10.86	0.004*	[3, 6)
	Low sound quality	4.98	0.083*	[3, 6)
	Manual difficulty	1.82	0.402	[0, 3)
	Poor hygiene / problems with the mold or tube	1.82	0.402	[6, 8]
	Difficulty changing the batteries	0.14	0.931	[0, 3)
Others	Microphony	0.50	0.779	[6, 8]
	Climate issues	0.24	0.889	[0, 3)
	Little clarification	10.90	0.004*	[0, 3)
	Other reasons	4.00	0.135	[0, 3)

*p-value < 0.05; *trend towards significance **Subtitle:** IHA = individual hearing aid; h/day = hours per day

users. This complaint was significantly more prevalent among residents of Alegrete (66.7%), the municipality furthest from the hearing health service, compared to residents of Agudo ($p = 0.003$), Mata ($p = 0.037$), Paraíso do Sul ($p = 0.022$) and São Gabriel ($p < 0.001$). Furthermore, a significant relationship was found between shame about using hearing aids and occupation, with professionals working in general services reporting feeling more ashamed to use the device (33.33%) compared to retirees ($p < 0.001$) (Table 3).

Emotional issues were cited considerably more often as a barrier to continued use of hearing aids by women compared to men ($p = 0.008$), while the prevalence of fear of damaging the device as a justification for low use was significantly higher among men (38.46%) compared to women ($p = 0.010$). Furthermore, the fear of damaging the devices showed an association with the users' occupation ($p = 0.044$).

Unemployed subjects also reported emotional complaints (28.57%), differing significantly from retirees ($p = 0.002$) and farmers ($p = 0.030$).

A significant difference was found in the complaint of lack of clarity regarding the use of hearing aids in relation to household composition. Individuals who lived with children had a higher prevalence of this complaint (26.67%) when compared to those who lived with their spouse ($p < 0.001$), with spouse

and children ($p = 0.001$), with other household arrangements ($p = 0.041$) or alone ($p = 0.037$).

Regarding manual difficulty, individuals who lived with "others" had greater difficulty handling hearing aids (20.83%) compared to those who lived with their spouse ($p = 0.018$) or spouse and children ($p = 0.022$).

Environmental and climatic factors were frequently cited as a reason for low adherence to treatment, mainly by subjects residing in the municipalities of Itaqui (33.33%) and Santa Maria ($p = 0.002$), compared to other locations ($p = 0.014$).

Regarding user satisfaction with the devices, it was found that both the overall score and the results of the subscales indicated a high level of satisfaction among the research participants (Table 4).

The subscale called "personal image" (Table 5) was the category that presented the most dispersed distribution of data, with the highest number of dissatisfied users ($n = 19$) and the lowest number of very satisfied users ($n = 36$).

When analyzing the relationship between the level of user satisfaction and the reasons for the low use of amplification devices, a significant association was identified between the satisfaction subscale "negative effects" and the physical complaints reported by users ($p = 0.037$), as well as between the subscale "services and costs" and the report of little clarification about the use of the devices ($p = 0.036$).

Table 3. Association of reasons for low use of personal hearing aids with sociodemographic and contextual characteristics

Reasons for the low use of IHA	Sociodemographic and Contextual Characteristics	G2	P value	Cramer's V	Degree of association
Low sound quality	city where you live	31.339	0.003	0.348	strong
Shameful to use	occupation	17.723	0.007	0.322	strong
Manual difficulty	who you live with	11.996	0.017	0.245	moderate
Difficulty changing the batteries	type of service	4.0365	0.045	0.146	weak
Emotional issues	sex	7.110	0.008	0.187	weak
	occupation	13.310	0.038	0.284	
	who you live with	10.244	0.037	0.251	
Fear of damaging the device(s)	sex	6.773	0.009	0.181	weak
	occupation	12.950	0.044	0.261	
Little clarification	who you live with	12.430	0.017	0.294	moderate
Physical complaints	type of service	4.544	0.033	0.154	weak
Use only for activities you deem necessary	sex	4.781	0.029	0.155	weak
Climate issues	city where you live	23.53	0.036	0.491	strong
Extra-auditory complaints	type of service	15.384	<0.001	0.222	moderate
	scholarity	16.302	0.022	0.343	
	who you live with	13.917	0.008	0.219	
Not feeling any benefit from hearing aids – RE	displacement	7.910	0.048	0.281	moderate
Impossibility of use	sex	7.555	0.0076	0.189	weak

Subtitle: G2 = likelihood ratio; RE = right ear; IHA = individual hearing aid

Table 4. User satisfaction scores with electronic sound amplification devices

SADL	Average	SD	PVC (%)	Normative values
Positive effects	5.84	0.79	13.53	4.9 (3.8-6.1)
Services and costs	5.98	0.88	14.72	4.7 (4.0-5.7)
Negative factors	5.64	1.30	23.05	3.6 (2.3-5.0)
Personal image	5.97	1.86	14.41	5.6 (5.0-6.7)
Global score	5.86	0.66	11.26	4.9 (4.3-5.6)

Subtitle: SADL = Satisfaction With Amplification In Daily Life; PVC = percentage variation coefficient; SD = standard deviation; % = percentage

Table 5. Classification of overall satisfaction and subscales of users with sound amplification devices

SADL	Statistic	Classification			General
		Dissatisfied	Satisfied	Very Satisfied	
Positive effects	N	2	111	88	201
	Average	3.57	5.31	6.55	5.84
	SD	0.33	0.53	0.32	0.79
Services and costs	N	7	55	139	201
	Average	3.40	5.11	6.46	5.98
	SD	0.23	0.43	0.41	0.88
Negative factors	N	5	40	156	201
	Average	1.8	0.39	6.21	5.64
	SD	0.65	0.68	0.67	1.3
Personal image	N	19	146	36	201
	Average	4.18	5.98	6.92	5.97
	SD	0.50	0.57	0.34	0.86
Global score	N	4	54	143	201
	Average	4.11	5.10	6.20	5.86
	SD	0.21	0.36	0.38	0.66

Subtitle: SADL = *Satisfaction With Amplification In Daily Life*; N = absolute number; SD = standard deviation

DISCUSSION

Among the individual reasons for underutilization of hearing aids, the most frequent was low perception of hearing difficulties, predominant among users with usage time of zero to three hours per day. Other research has also identified as a reason for low adherence the fact that many subjects do not perceive the need to use the devices^(7,14-17). Similarly, studies conducted with the elderly population show a reduced perception of hearing handicap, both among individuals residing in long-term care institutions⁽¹⁸⁾, and among socially active elderly⁽¹⁹⁾.

It was observed that, of the individuals who reported a low perception of hearing difficulties, the majority (66.17%) were retirees, thus inferring that they had lower hearing demands because they did not have equitable opportunities to achieve full social participation⁽²⁰⁾ due to lack of access to collective activities and reduced social demands, which contributes to the undervaluation of the need to use hearing aids.

Furthermore, among the individual reasons, it was found that shame about using hearing aids showed a significant relationship with the group with very low usage time (zero to three hours per day) and demonstrated a strong association with the individuals' occupation. The social stigma⁽³⁾ related to the use of hearing aids remains a recurring barrier to adherence to treatment, and social and work environments still generate insecurity for users. This occurs because the use of sound amplification devices makes hearing impairment visible, which can negatively impact self-image and social interaction. This impact could also be observed and ratified during the application of the satisfaction questionnaire, which revealed a greater number of dissatisfied individuals in the subscale related to personal image.

Social prejudice associated with the use of hearing aids can manifest itself in a veiled way in the discourse of users, often through justifications such as the lack of perception of the needs imposed by hearing loss, which

was the most cited reason in the present study, mainly by the elderly, and may be linked to the concern of appearing "older or senile"⁽³⁾.

In addition to the impact on self-image, the results of the present study showed a statistically significant difference in the impact of emotional issues, which affected more women than men and showed an association with the group with less daily use of the devices. Within the category of individual motives, these findings indicate that emotional barriers constitute determining factors for adherence to hearing aids. This result confirms the systematic review⁽²¹⁾, which identified a more recurrent association between loneliness and hearing loss in female individuals. Furthermore, the literature highlights the importance of motivation in the hearing aid adaptation process using tools that encourage adherence to treatment⁽²²⁾.

Within the category of technical reasons, the fear of damaging the device as a justification for insufficient use of the devices was the most frequently self-reported, being more evident in the group that used the amplification devices for three to six hours a day. Regarding sociodemographic and contextual characteristics, it was found that this fear showed a significantly greater association among men, in addition to being related to the individuals' occupation. This finding may be associated with work demands and the functions traditionally assigned to men who, historically and socially, are designated for productive work, while women perform reproductive tasks⁽²³⁾. In the sample studied, most men performed activities related to agriculture or general services, contexts that involve greater exposure to dust, humidity, sweat and risk of loss of hearing aids.

Linked to the occupational reality of the sample, another recurring issue for the low use of hearing aids was the climatic factor, since the Southern Region of the country is characterized by frequent rainfall and high humidity levels. This condition was especially evident during the data collection period, which contributed to the ineffective use of the devices. It is known that the amplifier and microphone are sensitive to humidity, which can cause oxidation and damage the devices. This fact confirms the findings of a

study⁽⁸⁾ carried out in five hearing health services in the states of São Paulo, Bahia and Mato Grosso do Sul, authorized by the Ministry of Health to provide assistance to people with hearing impairments. The study found that failures in these components were the most recurrent in devices adapted by the SUS.

This study observed that a lack of understanding regarding the use of hearing aids was more frequent among users who lived only with their children, compared to other household arrangements, highlighting the low participation of these family members in the auditory rehabilitation process of their parents. However, authors of a study⁽²⁴⁾ found that living with family members, or being close to them, can facilitate contact, support and care between generations, a finding that contrasts with the results of the present research. Furthermore, it was found that a lack of understanding is associated with the group with very short periods of use of the devices, which reinforces the influence of family support on the proper management of hearing aids.

It is believed that due to hearing loss and the large amount of new information and situations experienced during the rehabilitation process, users tend to have difficulty retaining all the information conveyed to them during consultations. As a consequence, doubts and a lack of adequate clarification about the use of hearing aids can compromise adherence to treatment, as observed in the sample of this study, where little knowledge showed a significant association with the shorter duration of device use. In this context, the support of other people proves to be an essential facilitator for the success of auditory rehabilitation⁽²⁵⁾.

In general, low perceived sound quality was the third most cited reason for underutilization of hearing aids, being more evident among subjects who used the devices for zero to three hours a day. A study⁽¹⁷⁾ conducted with elderly people who had been fitted with new hearing aids for six months identified dissatisfaction with the sound quality of the devices as one of the most reported problems after fitting. In the case of the sample in the present study, dissatisfaction with sound quality was strongly associated with individuals who lived in municipalities far from the hearing health service responsible for rehabilitation. It is believed that the difficulty of accessing the service⁽²⁶⁾ for adjustments and guidance contributes significantly to the low use of the devices.

Performing electroacoustic verification is a means of reducing complaints related to sound quality, as it leads to more precise and individualized adjustments, providing objective information aimed at the comfortable audibility of all sound signals and speech characteristics. A recent study identified that, after adjustment using electroacoustic verification, performed on hearing aid users who had been using the device for at least one year, these users showed substantial improvement in the degree of satisfaction and in speech perception in silence and noise⁽²⁷⁾.

The absence of electroacoustic verification as a routine procedure in the service studied may have been one of the factors that influenced the increase in user complaints regarding the sound quality of hearing aids, culminating in low adherence to treatment, a factor considered a limitation of this study.

Despite the low adherence to the rehabilitation process, it was observed that the overall and subscale scores indicated a high level of satisfaction among the participants. This finding confirms an integrative review that investigated the satisfaction of users of the Unified Health System (SUS) with the amplification devices received and that also identified high levels of satisfaction with the devices provided⁽²⁸⁾.

It was observed that the “personal image” subscale, which assesses self-image and the stigma associated with the use of hearing aids, concentrated the largest number of dissatisfied users. This result is consistent with the findings of a scoping review⁽²⁹⁾ which identified, in most of the studies analyzed, a negative impact of stigma on the use of hearing aids.

The findings of the present study converge with the results of a systematic review⁽³⁰⁾ conducted in a child population (0-3 years of age) using individual hearing aids, in which the Theoretical Domains Framework was used to identify barriers and facilitators related to the consistent use of the devices. Although directed at a different population, the study also showed that adherence to treatment is due to the influence of multiple behavioral domains, such as level of information, environmental and social context, and emotional aspects. Similarly, in the present analysis, carried out with adults and the elderly, it was observed that low adherence to the use of hearing aids was associated not only with technical factors, but, above all, with a lower perception of hearing disadvantages, emotional barriers, and the social context of individuals. Therefore, interventions focused exclusively on technical guidance are insufficient, and it is essential to incorporate strategies that consider cognitive, emotional, and contextual dimensions in order to promote the consistent use of the devices.

Another limitation of the study is the lack of stratification of participants into new and experienced users of hearing aids, which could allow for more detailed comparative analyses between these groups. However, overall, this limitation does not appear to have compromised the qualitative analysis of the reasons associated with inconsistent use of the devices.

CONCLUSION

The reduced perception of hearing disadvantages was the main individual reason for the low use of hearing aids, especially among users who used them for less than three hours a day. Among the technical reasons, the fear of damaging the device stood out, being more frequent in the group that used the devices for three to six hours a day and associated with the variables sex and occupation. An association was also observed between the shame of using the hearing aid and the occupation variable. However, despite the underutilization, participants reported overall satisfaction with their hearing aids.

Therefore, it becomes essential to implement strategies that promote continuous engagement in the rehabilitation process, including more frequent follow-ups and guidance regarding the consequences of untreated hearing loss and the importance of the continued use of hearing aids. Other relevant actions involve facilitating access to resolve simple problems related to the device and strengthening partnerships with Community Health Workers for continuous support in the field. Effective

adherence to treatment represents not only healthcare but also an ethical commitment to public investment.

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