

Impact of hearing aids on the quality of life of adults with adult disabilities: scope review

Impacto da protetização auditiva na qualidade de vida do adulto com deficiência auditiva: revisão de escopo

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ABSTRACT

Purpose: To verify the benefits of hearing aids in the quality of life of adults with hearing loss. **Research strategy:** Scoping review guided by PRISMA recommendations. **Selection criteria:** with the help of the keywords “hearing aids”, “hearing aid”, “cochlear implant”, “speech therapy”, “hearing impairment”, “hearing loss”, “quality of life”, and their respective in English and Spanish in the virtual databases: LILACS, SciELO, PubMed, SCOPUS, Web of Science and Open Grey. Qualitatively analyzed. **Results:** 1,312 records were identified and six articles were selected, with a hearing aided population from 18 to 92 years old, from both genders, cochlear implant and individual sound amplification device users. Questionnaires were used (assessment of expectations of adults/elderly users of hearing aids, International Outcome Inventory For Hearing Aids, Nijmegen Cochlear Implant, Satisfaction, Caregiver Strain Questionnaire, Relative to the Index, World Health Organization Quality of Life-bref, Glasgow Health Status Inventory, Abbreviated Profile of Hearing Aid Benefit, Cochlear Implant Quality of Life and scales (Care Giving Burden Scale), Denver Quantified and visual analog). The results indicated a better quality of life in the domains tested, both in the view of deaf adults and their partners. **Conclusion:** Despite the heterogeneity of the quality of life protocols used in the selected studies, it was possible to verify that hearing aids increase the quality of life of adults with hearing loss.

Keywords: Hearing aids; Hearing aid; Cochlear implant; Speech therapy; Hearing impairment; Hearing loss; Quality of life

RESUMO

Objetivo: Verificar os benefícios da protetização auditiva na qualidade de vida do adulto com deficiência auditiva. **Estratégia de pesquisa:** Revisão de escopo, guiada pelas recomendações PRISMA. **Crerios de seleção:** A busca foi realizada com o auxílio dos unitermos “auxiliares de audição”, “aparelho auditivo”, “implante coclear”, “fonoaudiologia”, “deficiência auditiva”, “perda auditiva”, “qualidade de vida”, e seus respectivos em inglês e espanhol, nos bancos virtuais de dados: LILACS, SciELO, PubMed, Scopus, Web of Science e OpenGrey. Os dados foram analisados qualitativamente. **Resultados:** Foram identificados 1.312 registros e selecionados 6 artigos, com população protetizada auditivamente, dos 18 aos 92 anos, de ambos os gêneros, usuários de implante coclear e aparelho de amplificação sonora individual. Foram utilizados os seguintes instrumentos: Questionário de avaliação das expectativas do adulto/idoso novo usuário de próteses auditivas, *International Outcome Inventory For Hearing Aids*, Questionário Nijmegen de Implantes Cocleares, Questionário de Satisfação do Cliente, *Caregiver Strain Questionnaire*, Formulário de Questionário Relativo ao Índice, *World Health Organization Quality of Life-bref*, *Glasgow Health Status Inventory*, *Abbreviated Profile of Hearing Aid Benefit*, *Cochlear Implant Quality of Life*, *Caregiver Burden Scale*, Escala Quantificada de Denver e Escala Visual Analógica. Os resultados indicaram melhor qualidade de vida nos domínios testados, tanto na visão dos adultos surdos quanto na de seus parceiros. **Conclusão:** Apesar da heterogeneidade dos protocolos de qualidade de vida utilizados nos estudos selecionados, foi possível verificar que a protetização auditiva melhora a qualidade de vida do adulto com deficiência auditiva.

Palavras-chave: Auxiliares de audição; Aparelho auditivo; Implante coclear; Fonoaudiologia; Deficiência auditiva; Perda auditiva; Qualidade de vida

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Conflict of interests: No.

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INTRODUCTION

The hearing is the sensorial function that allows us to captivate the sounds, analyze them and attribute meaning. It is the fundamental part of the complete development of the human race and, when modified, affects the basis of oral communication. Therefore, the hearing impairment (HI) results from the decreased ability to hear sounds, which can affect the subject to different degrees⁽¹⁾.

According to Instituto Brasileiro de Geografia e Estatística (IBGE), in 2013, approximately 2,2 millions of people had hearing impairment in Brazil, which is equivalent to 1,1% of the population, with 0,2% having the disability since birth⁽²⁾. As a consequence of hearing loss, the individuals can show communication difficulties, social isolation, depression and negative feelings that directly impacts the quality of life and the perception of their health condition⁽¹⁾.

The impacts of the hearing loss still suffer the influences of aspects related to health assistance, to socio demographics factors and clinical. The use of hearing aids is one of the ways to reduce the impacts caused by hearing loss on a individuals' life. The sound amplification is not restricted to making speech sounds audible and satisfactory, but also provides the perception of environmental, danger and warning signs, essential for independence in everyday life and improving quality of life⁽³⁾.

A resource that seeks to minimize the damage of hearing loss is a hearing aid (HA), an electronic mini amplifier, whose purpose is to compensate for the limitations and impediments caused by reducing hearing acuity, improving the speech comprehension in many situations. Its goal is to maximize the auditory residual through the capture of environmental and speech sounds, with increased sound intensity⁽⁴⁾, making the auditory residue more functional and providing better quality of life and user protection. Another resource that seeks to minimize the damage of hearing loss is cochlear implant (CI), which acts to transform sound into an electrical impulse, transmitting it directly to the cochlear nerve. This way, it benefits people with severe and profound neurosensorial hearing loss that present little or no use of conventional hearing aids⁽⁵⁾.

The World Health Organization (WHO) defined, in 1998, the quality of life as the individual's perception about their position of life, in cultural context, values system and related to their purposes, expectations, standards and worries. Furthermore, it established that the health's social determinants are related to the conditions in which a person lives and works, impacting health status and quality of life. According to WHO, it should be considered the social, economics, cultural, racial, psychological and behavioral factors which influence the occurrence of health problems and risk factors for the population, such as living, food, education, income and employment. To evaluate the quality of life of HA and CI users is an important indicator of the benefits of hearing aids, because it allows defining the implications of best auditory capacity in daily activities, leisure and communication.

Believing in the negative interference of hearing impairment in the quality of life and the importance of auditory rehabilitation, more specifically the use of hearing aids and cochlear implants for adequate interaction of the deaf individual in the environment and the consequent improvement in quality of life, it chose for carrying out this scope review work.

PURPOSE

To verify the benefits of hearing aid in the quality of life of adults with hearing impairment.

RESEARCH STRATEGIES

This scoping review was carried out in accordance with data of PRISMA (*Preferred Reporting Items for Systematic Re-views and Meta-Analyses*)⁽⁶⁾ and registered on PROSPERO database under ID: CRD42022363325. The Free, Prior and Informed Consent (FPIC) was dismissed by the Institution Ethics Committee, since this is a scope review, that is, the research is based on data that has already been collected by another work and arranged in a database. The research was made in the Portuguese, English and Spanish languages, considering only the published studies in the last ten years.

SELECTION CRITERIA

The research was carried out using the strategy P.C.O. (P-patients; C-context; O-outcome) to elaborate the question: "What are the impacts of hearing aids (O) in the quality of life (C) in deaf adult individuals (P)?"

It included descriptive and observational studies, without language restriction, with a hearing aided population from 18 to 92 years old, cochlear implant (CI) and personal sound amplification product (PSAP) user, from both genders.

It excluded out-of-scope studies, hearing impairment with associated comorbidities studies, case studies, clinical trials, articles that it was not clear the impacts on the quality of life of the hearing aided, review articles and letters/editorials. Studies that contained hearing impairment with associated comorbidities were excluded because the impacts on the quality of life of the person with a hearing aid could be biased due to the comorbidities.

DATA ANALYSIS

The research was made by four authors, in an independent way. A systematic search was carried out in the following databases: LILACS, SciELO, PubMed, Scopus and Web of Science. The "gray literature" search occurred on the OpenGrey platform.

The descriptors was selected through the Health Sciences Descriptors (DeCS). The research was made in the Portuguese, English and Spanish languages, considering only the published studies in the last ten years, using the Boolean Operators "AND" and "OR" for better and comprehensive search strategy. The uniterms used were: "auxiliares de audição", "aparelho auditivo", "implante coclear", "fonoaudiologia", "deficiência auditiva", "perda auditiva" e "qualidade de vida", "hearing aids", "hearing aid", "cochlear implant", "speech therapy", "hearing impairment", "hearing loss" and "quality of life". The research was developed between November and December in 2022. In order to identify additional studies, a manual search

was carried out in the reference of those considered eligible for this review.

The studies selection process occurred in two steps. In the first step, two reviewers analyzed, independently, the titles and summary. The work that did not attend the purposes of this review were excluded. In the next step, the previously selected articles were submitted to a complete analysis of the text, in order to verify if the contents contemplated the eligibility criteria. In cases in which there were discrepancies between the two reviewers, third and fourth reviewers were consulted for the final decision. The excluded articles were registered and the reasons for exclusion were defined.

The datas were extracted for four authors independently and the record was made in two standardized tables, in which contained the following datas: author; year; language; sample (number of subjects, age and gender); used protocols, main results (CI or HA, bilateral or unilateral) and the conclusion of the studies.

Risk of bias analysis

The Risk of Bias was analyzed by the device *Joanna Briggs Institute – JBI*⁽⁷⁾, using a free translation from English to Portuguese. The assessment questions (Q) were: Q.1 Were the sample inclusion criteria clearly defined? Q.2: Were the

study subjects and scenarios described in detail? Q.3: Was exposure measured validly and reliably? Q.4: Were objective, standardized criteria used to measure the condition? Q.5: Have confounding factors been identified? Q.6: Have strategies been established to deal with confounding factors? Q.7: Were the results measured validly and reliably? Q.8: Was appropriate statistical analysis used?

The questions presented four categories of possible answers: yes (1 point), no (0 point), uncertain (0,5 point) and not applicable. The Risk of Bias was considered high if the study obtain until 49% of “yes” answers (0 to 3,5 points), moderate 50% to 69% (4 to 5,5 points) and low when it obtains results equal or higher than 70% of “yes” (6 to 8 points). The device was not used as an exclusion criteria, but to an article quality evaluation. The results obtained were analyzed qualitatively, due to the heterogeneity of studies.

RESULTS

Studies selection

The Figure 1 shows the steps of identification, screening, eligibility and inclusion of the articles during the research. Initially, 1.312 articles were identified in the 6 databases. Of these,

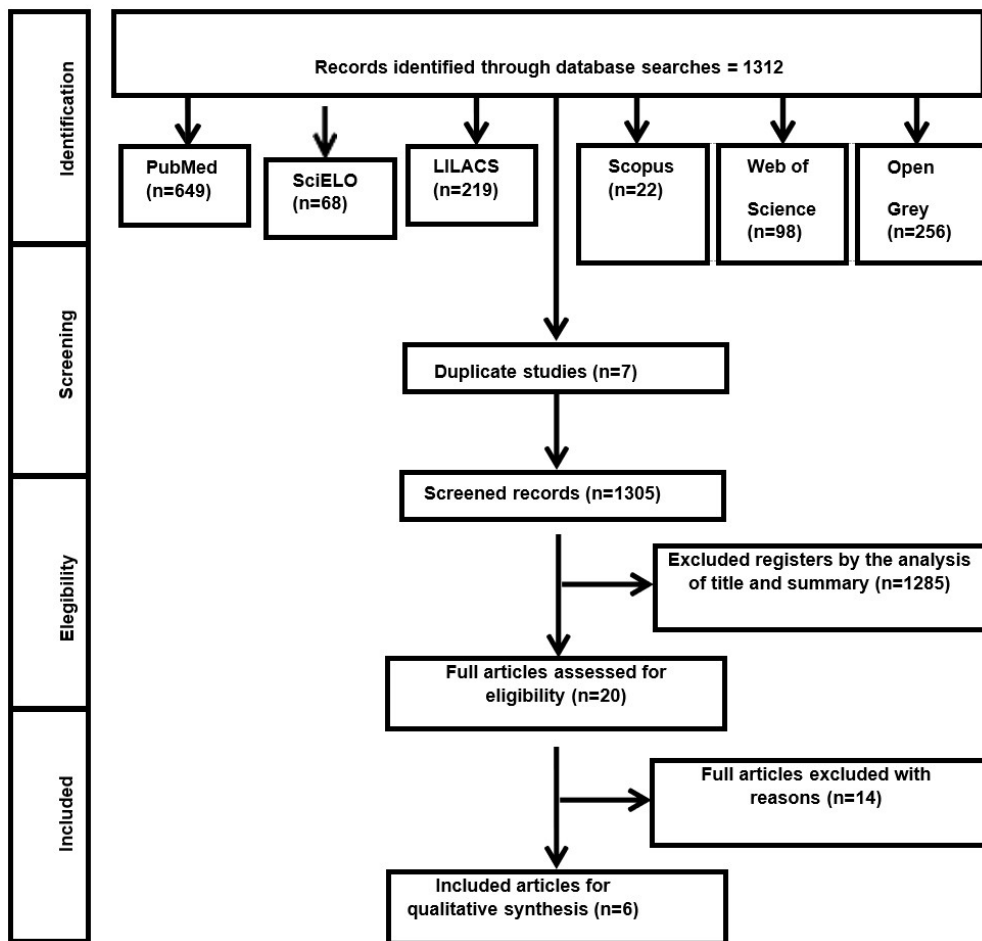


Figure 1. Data from the identification, screening, eligibility and inclusion stages of articles during the research

7 studies were duplicated and, because of that, were removed. After the removal of the duplicated studies, 1.305 studies were analyzed based on the title and summary. Afterwards, 1.285 were excluded, leaving 20 possibly eligible articles. A manual search was also carried out, however it was not found any article that fit the research criteria. Therefore, 20 articles were submitted to full reading. Of those, 14 did not contemplate the eligibility criteria established by the research.

Studies characteristics

6 articles^(1,8-12) were included in this scope review that reported the presence of benefits of hearing aids on the quality of life. In Table 1 and Table 2 it is possible to notice the total sample was composed by participants of both genders, HA and CI users, ages between 18 and 92 years old (average age: 55 ± 37 years old).

Table 1. Description of the characteristics of the study, sample and type of hearing aid performed in the selected studies

Identification and type of study		Sample	Type of hearing aid and localization
Authors	Type of study	N/Gender/Age	Device/Characteristics
City/country of study and Publication Language			
Moura et al. ⁽⁸⁾ Santa Maria Brazil/Portuguese	Observational and prospective	N=28 Age: 61 to 94 anos (average of age 77 years old and 5 months \pm 16 years old and 5 months). Gender: 16 M and 12 F	Device: HA Localization: bilateral. It does not specify the period of time and the period of disability
Chen et al. ⁽⁹⁾ Toronto Canada/English	Cross-Sectional and qualitative	N=43 Age: average of 62 years old \pm 10 years old and 5 months. Gender: 20 F and 23 M	Device: CI Average usage time: 5 years e 6 months \pm 6 years Period of HI before the use of CI (5 between 0-4 years; 4 between 5-9 years; 4 between 15-19 years and 6 with 20 years or more). It does not give information about the side of use.
Ramos-Macías et al. ⁽¹⁰⁾ Las Palmas Spain/English	Observational descriptive	N=150 Gender: 80 F and 70 M Ages: 18 to 60 years old (N=100) and over 60 years old (N=50). Average age 39 years old \pm 21 years old.	Device: CI unilateral and bilateral. Usage time between 1 and 10 years. It does not inform the duration of the auditory disability.
Sousa et al. ⁽¹¹⁾ São Paulo Brazil/English	Clinical cross-sectional	N= 26 Gender: 14 F and 12 M Age: 18 to 62 years olds Average age 40 years old \pm 22 years old.	Device: CI unilateral and bilateral. Average time of use: 80 months.
Ribeiro et al. ⁽¹⁾ Belo Horizonte Brazil/Portuguese	Observational and Cross-Sectional	N= 114 Gender: 59 F and 55 M Age: 19 to 92 years old Average age 55 years old e 5 months \pm 36 years old e 5 months.	Device: HA It does not inform the side of use and usage time. Period of Hearing loss: between 0 to 60 years.
McRackan et al. ⁽¹²⁾ Charleston United States/English	Cross-Sectional	N= 41 Gender: 23 M and 18 Age: greater than or equal to 18 years old. Average age 63 years old and 9 months \pm 10 years old and 1 month.	Device: CI Unilateral e bilateral. Period of use: 12 months. Period of hearing disability:17 years.

Subtitle: N = numbers of participants of the sample; M = masculine; F = feminine; HA = hearing aid; CI = cochlear implant; HI = hearing impairment

Table 2. Description of study identification data, protocols and questionnaires used, main results and conclusion of selected studies

Identification data	Methodology	Results of the application of Quality of Life questionnaires and protocols and Conclusion
Authors	Protocols/Questionnaires	Principal results and article conclusion
Moura et al. ⁽⁸⁾	It was used two questionnaires: the questionnaire to evaluate the expectations of adults/elderly users of hearing aids, to investigate concerns prior to the use of hearing aids and the International Outcome Inventory For Hearing Aids (IOI – HA), to measure the level of subjective benefit of the user of hearing aids in relation to your hearing aid and the environment	In the questionnaire of evaluation of the expectations of adult/ elderly, a low level of concern regarding hearing aids was observed, while in IOI-HA there was a positive assessment of the use of hearing aids. Therefore, after analyzing the data, it was verified that the concerns did not interfere with the subjective benefit reported by the patient.
Chen et al. ⁽⁹⁾	The authors idealized two instruments: The instrument filled by the implanted patients, based on Nijmegen Cochlear Implants Questionnaire – NCIQ and Cochlear Implant Satisfaction Questionnaire – CISQ and the instrument filled by the caregivers and partners, based on <i>Caregiver Strain Questionnaire</i> , <i>Care Giving Burden Scale</i> (CGBS), Quantified Denver Scale (modified for the partners), Index Relative Questionnaire Form (IRQF) and Client Satisfaction Questionnaire (CSQ)	Regarding the users, it was noted the following aspects: talking to other people in a calm environment; more safety and self confidence to talk; hear cars approaching in traffic with improvements greater than 80% and the ones that presented relative improvement (less than 50%): auto perception with HI and the fact that the hearing is not a limiter factor anymore in their lives, sound localization (behind), watch TV and listen to music. Regarding the partners/caregivers: report of improvement in every physical well-being, emotional, social and general domains. In general, the use of CI demonstrated to have significant benefits for the psychosocial well-being, both CI users and their caregivers/ partners.
Ramos-Macías et al. ⁽¹⁰⁾	It was applied two instruments: <i>Glasgow Health Status Inventory</i> (GHSI) with an specific focus on auditory difficulties and its impacts in daily life (through the interviewer's report) and <i>Abbreviated Profile of Hearing Aid Benefit</i> (APHAB) with focus on the auditory capacity in a variety of daily situations and self-evaluation.	After analyzing the different subscales of the Glasgow Benefits Inventory, they showed no relationship between the physical subscale and communication skills, concluding that CI treatment provided to elderly patients with hearing impairment has the potential to improve quality of life and understanding speech to a similar degree as observed in younger CI users. The APHAB demonstrated no evidence of influence between self-reported general health and patient variables (gender, implant configuration, age, or duration of post-implant experience). However, the neural network model demonstrated influence on general health status from self-reports of social support, physical health, and self-rated difficulties communicating, both in noise and easier listening environments. Therefore, there was an increase in quality of life immediately after implementation, regardless of age. Users using bilateral CI showed better results in environments with background noise and in reverberant rooms than users of unilateral CI.
Sousa et al. ⁽¹¹⁾	The following questionnaires were used: the Cochlear Implant Nijmegen and the World Health Organization Quality of Life bref (WHOQOL-bref). Both were sent via electronic media.	The Nijmegen of Cochlear Implants (NCIQ-P) demonstrated that the social domain (limitations in activities and social interactions) was the highest scored aspect in the sample, with percentages of 70.2% and 72.9% respectively, followed by the psychological and physical domain, with the percentage of 69.9% and 67.8%, respectively. In WHOQOL-bref, the psychological and physical domains were the best evaluated aspects, with 73.6% and 72.5%, respectively, followed by the domains of social relationships and environment and obtained an average percentage of 69.9% and 61.1%, in that order. In general, CI brought benefits related to the quality of life of the subjects in the sample
Ribeiro et al. ⁽¹⁾	The World Health Organization Quality of Life bref (WHOQOL-bref) instrument was used to measure the quality of life of HA users.	The study allowed us to verify that users who used HA effectively had a greater chance of presenting a good perception of their overall quality of life. The quality of life of HA users was related to socio-environmental, demographic and clinical factors, as well as the perception of general health status, which can be influenced by factors such as the presence of dizziness and education.
McRackan et al. ⁽¹²⁾	Two instruments were applied: the Cochlear Implant Quality of Life (CIQOL- Profile) and the Visual Analogue Scale (VAS) from 0 to 10, so that users could evaluate their general satisfaction with the CI.	The emotional, entertainment and social domains of the CIQOL demonstrated superior benefits and the communication and listening effort domains and the global score demonstrated inferior benefits. On the Visual Analogue Scale, there were no differences in self-reported CI satisfaction expectations. In general, patients' expectations before cochlear implantation can influence their post-operative quality of life, but not post-operative speech recognition.

Subtittle: HI = hearing impairment; CI = cochlear implant; HA = hearing aid

Risk of bias

The 6 articles^(1,8-12) included in this scope review contemplated every JBI⁽⁷⁾ verification criteria and obtained a score sufficient to qualify for a low risk of bias.

DISCUSSION

This scope review tried to bring data about the impacts of hearing aids in the quality of life in deaf adult individuals.

During the research it was possible to notice that half of the selected studies^(1,8,11) are from Brazil. The presence of hearing impairment can lead to serious consequences to speech and learning development. It impacts the quality of life, being determined by the age of the acquisition of the loss, nature, hearing loss degree, lifestyle, occupation and perception of social and emotional disadvantages^(13,14-16). Therefore, it ratifies, in this study, the worry of researchers and clinicians from Brazil and the world about the quality of hearing aid in deaf adult individuals.

The included studies were published between 2013 and 2021, with greater concentration in 2016, showing that the last two decades have been the subject of research on the subject.

The results obtained in the present study pointed to greater use of the instrument *World Health Organization Quality of Life-bref* (WHOQOL-bref)^(17,18-20) (abbreviated version) to the quality of life scale (QOLS) of HA and CI users, used in two articles^(1,11). The questionnaire is composed of 26 questions, with scores that vary between 1 to 5 points, distributed across the domains: perception of quality of life, satisfaction with general health, physical, psychological, environment and social relationships. The WHOQOL-bref, an abbreviated version of WHOQOL-100, developed and recommended by World Health Organization (WHO) values the individual perception, being able to evaluate the QOLS in different groups and situations, regardless of education level. The WHOQOL-bref questions are formulated for scales answers like Likert, including intensity (“nothing” to “extremely”), capacity (“nothing” to “completely”), frequency (“nothing” to “always”) e evaluation (“unsatisfied” to satisfied”; “very bad” to “very good”). The scores in each domain are transformed in a scale from 0 to 100 and expressed in average terms, as recommended in the manual produced by the WHOQOL team, considering that higher averages suggest better QOLS perception. Therefore, the instrument presents satisfactory psychometric properties, demands less application time, being able to describe an individual’s subjective perception of their physical and psychological health, social relationships and the environment in which they live. However, it does not specifically measure QOLS through the use or not of hearing aids.

Other instruments were used, described and discussed below:

The questionnaire to the evaluation of expectation of an adult/elderly hearing aid user⁽⁸⁾, consists of an instrument that allows the professional to know the adult/elderly patient about their expectations regarding the use of hearing aids and their rehabilitation. It has 12 questions, divided in two scales or dimensions, in which, one refers to the expectations and the other to the concerns of these patients, englobing main aspects involved in the moments preceding the first experience with the personal sound amplification product. The questionnaire

was applied in only one⁽⁸⁾ of the included studies in this scope review and, for that reason, the comparison with others became limited.

The *International Outcome Inventory For Hearing Aids* - IOI – HA⁽⁸⁾ was developed as a product of an international workshop (*Self Report Outcome Measures in Audiological Rehabilitation*) about measures of auto evaluation in auditory rehabilitation, with translation to 21 languages, including portuguese. It is an instrument that makes it possible to measure the degree of subjective benefit of the hearing aid user in relation to their hearing aid and their environment, in addition to being a simple tool, easy to apply and serving as a facilitating instrument during the hearing aid acclimatization period. It evaluates seven domains considered important for the success of auditory rehabilitation: use, benefit, residual activity limitation, satisfaction, residual participation restriction, impact on others and quality of life. Despite its cross-cultural adaptation to Brazilian Portuguese, one study⁽⁸⁾ used it, making a more in-depth discussion about the instrument difficult.

The Nijmegen Cochlear Implants Questionnaire – NCIQ⁽⁹⁾ is characterized by being specific to QOLS evaluation in adult users of CI and with high internal consistency. It is composed of 60 questions divided in three general domains, with its respective domains: physic (basic perception of sound, advanced perception of sound and speech production), psychologic (self-esteem) and social (activity and social operation). It was only used in one study⁽⁹⁾, making it difficult to compare with others studies.

The Cochlear Implant Satisfaction Questionnaire – CISQ⁽⁹⁾ evaluates demographic, physical, psychosocial domains and QOLS charts of the CI recipient. It was only used in one study⁽⁹⁾, contributing to another limitation to be highlighted.

The *Glasgow Health Status Inventory* – GHSI⁽¹⁰⁾ is a questionnaire of 18 items filled by the patient, evaluating the state of health, measuring the effects of a health problem (in this case, the hearing loss) in the quality of life of a person. It allows cross comparison among many health conditions, different health interventions and demographics and cultural subgroups. The GHSI can be used any time and measures the general quality of life of a person and how the health problems affect them. It was also used by a single study⁽¹⁰⁾ in the selected sample.

The *Abbreviated Profile of Hearing Aid Benefit* – APHAB⁽¹⁰⁾ questionnaire, an abbreviated version of *Profile of Hearing Aid Performance* - PHAP and *Profile of Hearing Aid Benefit* – PHAB questionnaires, is composed of 24 items divided in four subscales of communication evaluation, including situations in favorable environment, the situations in the presence of noise, reverberant rooms and intense ambient sounds. It was also developed a software to analyze the obtained results in different subscales. This questionnaire offers informations that facilitates adaptation success perception, assisting the patient in analyzing the advantages and disadvantages of using amplification, helping them to understand its performance in certain situations, helping to adjust the hearing aid and evaluating the adaptation of the device, quantifying the benefit of amplification. The auto evaluation PHAP⁽¹⁰⁾ has the purpose of quantifying the support provided by the use of hearing aids in different daily life situations and evaluate the patient’s opinion regarding the use of amplification. Different everyday communication situations and reactions to

intense environmental sounds are covered. This questionnaire was expanded, creating a new questionnaire, PHAB⁽¹⁰⁾, that has the same instructions, items and answer alternatives of PHAP, adding two answer moments: with or without hearing aid. This questionnaire offers data to measure the benefit of amplification, comparing the answers in both situations, and it was only used in one study⁽¹⁰⁾.

The *Glasgow Health Status Inventory* – GHSI⁽¹⁰⁾ has as main focus the auditory difficulties and its impacts in daily life (via interviewer's report), meanwhile the *Abbreviated Profile of Hearing Aid Benefit* – APHAB questionnaire addresses the auditory ability in different everyday situations, however both are auto evaluations. It was also used by a single study⁽¹⁰⁾ in the selected sample.

The instrument *Cochlear Implant Quality of Life - CIQOL-35 Profile*, used in one of the studies⁽¹²⁾, was developed according to Patient-Reported Outcome Measures (PROMs) and Consensus-based Standards for the selection of health status Measurement Instruments (COSMIN). CIQOL-35 consists of 35 items in six domains constructs (communication, emotional, entertainment, environmental, auditory and social effort), that provide psychometrically sound and efficient measures, that can be used to evaluate the quality of life in adult CI users in clinical and research environment, besides Visual analogue scale – VAS⁽¹²⁾, which purpose is assist measuring the intensity of pain in the patient, and is an important instrument for checking the patient's progress during treatment and even at each appointment, in a more reliable way. It is also useful to analyze whether the treatment is being effective, which procedures have produced the best results and if there is any deficiency in the treatment, according to the degree of improvement or worsening of pain, it provides a simple measurement and the evolution of pain intensity through graphics.

Furthermore, researchers developed their own questionnaires. For example, the participants of a study⁽⁹⁾ replied a questionnaire consisted in modified questions, taken from the following questionnaires: *Caregiver Strain Questionnaire*⁽⁹⁾, *Care Giving Burden Scale* – CGBS⁽⁹⁾, Quantified Denver Scale (modified for the partners)⁽⁹⁾, Index Relative Questionnaire Form (IRQF)⁽⁹⁾ and Client Satisfaction Questionnaire (CSQ)⁽⁹⁾. Thus, these questionnaires aimed to evaluate demographics data, psychosocial domain of the partners and their perception over the changes in the quality of life of CI patients.

Based on the presented results, the use of an electronic device (HA or CI) proved to be of great importance to individuals with hearing impairment. The hearing aids, in case, are one of the ways to reduce the impact caused by hearing loss in an individual's life. According to the study⁽⁸⁾, sound amplification is not just restricted to making speech sounds audible and satisfactory, but also aims to provide the perception of environmental, danger and warning signs, essential for independence in everyday life and improving quality of life.

Besides proportionate the access to sounds and provide oral communication, the CI promoted auditory (re)habilitation, minimizing or prevents restrictions occasioned by hearing impairment, breaking barriers and paradigms in the communication process, in addition to being seen as an instrument that aims to facilitate social interaction, learning and the individual's cognitive and emotional development⁽¹³⁾.

Regarding expectations related to CI, authors⁽¹⁴⁾ counted on the participation of adolescent and adult patients with non-

discriminated ages, which is a bias that must be considered. They indicated, in general, a feeling of satisfaction on the part of users, who reported enjoying listening, although some indicated dissatisfaction and frustration regarding the expectation they had before the implant that they would be able to talk on the phone. The social effects related in this study were a more adequate social and professional insertion, because with the CI, the individuals started listening and understanding sounds, even in noisy environments.

Confronting the benefits discussed above, there are still many disagreements regarding CI. The deaf community is against the implant because they believe it is a setback in the fight for the recognition of Sign Language, its culture and way of being different from hearing people, or even due to lack of knowledge regarding its procedures and benefits. Health professionals, on the other hand, defend it as the most assertive means of treating people with hearing impairment, so that they can resume their social and professional practices, in order to optimize their interactions with hearing people and become more independent⁽¹⁴⁾.

Moreover, the greater satisfaction with the CI performance can influence the user's behavior, such as the increased device use, as shown in adult PSAP users, or the increased adherence to auditory training activities, which can, in turn, improve the user's functional abilities⁽¹²⁾.

Evaluate the quality of life of HA users can be an important indicator of the benefits of amplification⁽¹⁾, allowing to measure the implications of better auditory abilities in daily life, leisure and communicative activities. It was also noted the necessity of understanding the different aspects related to QOLS of adult CI user population, in order to obtain detailed informations, capable of assisting in the orientation process, in validating the results of this technology, as well as conducting the therapeutic process⁽¹¹⁾.

Four studies included in this review^(8,10-12) did not point the influence of bilateral implants related to unilaterals. However, a trend towards superior results was observed for users with bilateral devices, ratifying the literature⁽¹⁵⁾, that shows the importance of bilateral hearing to be functional, both for people with normal hearing and for those with HI. The bilateral amplification must be indicated for all patients with symmetric hearing loss, because they present binaural advantages, among them, better localization of the sound source, elimination of the shadow effect, ability to separate sounds from environmental noise, better speech recognition in the presence of noise in addition to binaural summation, as the sound presented in both ears is perceived with more intensity than in the monaural hearing. Therefore, unless there is a contraindication, the use of hearing aids is always the best alternative. According to professionals of the field, the indication of binaural use is a safety measure, because in addition to all the reported advantages, it prevents the auditory deprivation, described as a reduction of speech recognition, resulting from hearing loss without the use of amplification and resulting sensory deprivation. Thereby, the individuals with hearing loss and who need hearing aids or CI can be benefited in social, emotional and intellectual aspects, and better quality of life as a consequence.

Regarding the variables verified in studies, the gender, CI usage time and the hearing conditions did not influence the QOLS results, according to different instruments used by field researchers. The literature⁽¹⁶⁾ considers that CI usage time of

approximately two years is necessary to prove its benefits. However, in the selected studies, good results were observed regarding the time of use of hearing aid, even before completing one year of CI, showing that it is an effective treatment.

The articles listed in this review confirmed the importance of adherence to hearing devices in deaf individuals, demonstrating the presence of benefits during the use of hearing aids in quality of life, positively impacting the adult's daily practices. Besides the variability of resources and possibilities to measure the benefits of hearing aid in the quality of life in adults, standardization of the use of protocols and carrying out longitudinal studies could provide better support for the analysis of the parameters mentioned in the articles, these being the limitations to be considered in the present research.

Thus, through the results found in the literature, it was possible to verify that hearing aids promoted an improvement in the quality of life of adults with hearing impairment.

CONCLUSION

Despite the heterogeneity of the quality of life protocols used in the selected studies, it was possible to verify that hearing aids improve the quality of life of adults with hearing impairment. Standardization of the use of protocols and carrying out longitudinal studies could provide better support for the analysis of the parameters to be improved technologically, as well as included in the rehabilitation practice of these individuals. Therefore, It is essential to carry out new researches on the impacts of hearing aids on the quality of life of deaf adults, with the purpose of improving understanding of the impacts of hearing aids on the quality of life of adults with hearing impairment, taking into account the increase in the life surcharge, that is, the greater aging of the world population.

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