

Evidence-based

Speech-Language Pathology

Fonoaudiologia Baseada  
em Evidências

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## Questionnaires on satisfaction of amplification in children: a systematic review

### Questionários sobre a satisfação da amplificação em crianças: revisão sistemática

### ABSTRACT

**Purpose:** To perform a systematic review of the literature on questionnaires to assess the benefits of using hearing aids in children. **Methods:** A literature search was conducted in the data-bases Web of Science and Virtual Health Library (BIREME). The selection criteria included: title consistent with the purpose of this review; participants necessarily being children using hearing aids; and questionnaires to assess the benefits and satisfaction. **Results:** More evidence was found in studies that used the scale Parent's Evaluation of Aural/Oral Performance of Children (PEACH), making it possibly the most consistent scale on the subjective evaluation of the use of amplification in children. **Conclusion:** There is a paucity of studies with this approach; however, the results showed the importance of researches in this area, which turns the subject into an important field of research.

### RESUMO

**Objetivo:** Realizar revisão sistemática da literatura sobre questionários que avaliem benefícios do uso de aparelhos de amplificação sonora individuais em crianças. **Métodos:** Foi realizada uma revisão sistemática da literatura nas bases de dados *Web of Science* e no portal Biblioteca Virtual em Saúde (BIREME). Os critérios adotados incluíram título condizente com a proposta deste estudo, casuística necessariamente englobando crianças usuárias de aparelhos de amplificação sonora individuais, uso de questionários e os resultados dos questionários de avaliação do benefício e satisfação. **Resultados:** Maior evidência foi encontrada nos estudos que utilizaram a escala *Parent's Evaluation of Aural/Oral Performance of Children* (PEACH), tornando-a possivelmente a escala mais consistente na avaliação subjetiva do uso de amplificação em crianças. **Conclusão:** São escassos estudos com esse enfoque; contudo, os resultados obtidos demonstraram a importância de serem realizadas pesquisas nessa área, tornando esse um importante campo de investigação.

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## INTRODUCTION

Recent advances in the treatment of the hearing impairment have made possible the access to the auditory perception of speech sounds for children with sensorineural hearing impairment, providing valuable benefits to the communication and quality of life of children with hearing impairment.

The technological advance of the amplification systems, specifically the hearing aids (AASI), brings the necessity to evaluate the impact and the resultant benefits of these resources in the auditory abilities of its users as well as in the services rendered by the programs of auditory rehabilitation<sup>(1,2)</sup>.

The questionnaires to the parents of children who use AASI are a complementary tool that provides higher understanding of the specific difficulties of the child and assists in the best adjust of the used devices and in the accompaniment of the intervention in this population, helping to verify if the rehabilitation results are being reached.

Regarding to the presented problem, the objective of this study was to carry out a systematic review of the literature about questionnaires that evaluate benefits of the AASI use in children.

## METHODS

Considering that the systematic review is carried out from the formularization of specific questions that direct the search of publications, the question of this study investigation was: "Which are the satisfaction evaluation questionnaires related to the use of AASI in children with hearing impairment?"

The search strategy used was by means of "research through DeCS/MeSH keywords." The combination between the keywords was carried out: "Child"; "Hearing AIDS"; "Patient Satisfaction"; "Hearing Loss"; "Questionnaires"; "Child"; "Patient Satisfaction"; "Auditory Prosthesis"; "Questionnaires."

The bibliographical research was carried out in the databases *Web of Science* ([www.isiknowledge.com](http://www.isiknowledge.com)) and in BIREME – Biblioteca Virtual em Saúde (BVS) ([www.bireme.br](http://www.bireme.br)) that includes the databases LILACS, MEDLINE, Biblioteca Cochrane, SciELO and IBECs (Table 1). There was no restriction regarding to the year of publication, the studies published until December of 2012 were analyzed.

For the selection and evaluation of the raised scientific studies in the electronic search, the criteria were established

considering: type of studies (systematic reviews, meta-analysis and randomized controlled studies), participants (children who use hearing aids), the adopted intervention (use of questionnaires) and the evaluation of the results (evaluation of the benefit and satisfaction questionnaires).

In the search were evaluated and chosen only the studies whose heading, summary or body of the article had relation with the focus of the present study. After the selection of the summaries of found studies, pertinent to the proposed question was carried out the recovery of articles in complete text. The data of each one of the potentially relevant articles for systematic review were collected by means of a protocol form by two reviewers.

## RESULTS

Duplicated publications (31) and those which did not have the corresponding content to the proposed objective were excluded (378). At the end of the survey, six relevant articles<sup>(3-8)</sup> were selected for the systematic review, one of them was carried out in Brazil and the other five in another countries. Table 2 presents the main aspects of the studies selected for the systematic review.

Among the six studies<sup>(3-8)</sup> selected for this systematic review, only two articles<sup>(7,8)</sup> had answered to the main question, that was the use of questionnaire for the benefit and satisfaction evaluation in children who use AASI.

## DISCUSSION

The questionnaires to the parents of the children who use AASI have become one of the main allies of the physicians to evaluate the benefits and the satisfaction regarding to the amplification use<sup>(7)</sup>.

The studies<sup>(8,9)</sup> considered more specific to the ultimate topic of this systematic review had used the scale *Parent's Evaluation of Aural/Oral Performance of Children*, which was developed with the objective to evaluate the effectiveness of the amplification in children with different ages and hearing impairment levels. It is a measure of the functional performance of the child in situations of daily life based on the parents' systematic observations.

The fact of being a measure of the functional evaluation makes *Parent's Evaluation of Aural/Oral Performance of Children* extremely important to the audiology professionals,

**Table 1.** Publication number found for database in accordance with the keywords

Keywords	BVS (LILACS, MEDLINE, SciELO, Biblioteca Cochrane, IBECs)	<i>Web of Science</i>	Total
"Child" and "Hearing Loss" and "Patient Satisfaction"	24	16	40
"Child" and "Hearing Loss" and "Questionnaires"	86	51	137
"Child" and "Cochlear Implant" and "Patient do Satisfaction"	21	–	21
"Child" and "Cochlear Implant" and "Patient Satisfaction" and "Questionnaires"	6	–	6
Child and Cochlear Implant and Questionnaires	68	–	68
"Hearing Aids" and "Patient Satisfaction" and "Child"	32	17	49
"Questionnaires" and "Child" and "Hearing Aids"	57	37	94

**Table 2.** Relation of the studies analyzed for systematic review

Main author and year of the publication	Casuistry	Questionnaire	Objectives	Kind of study
Bamford et al., 1999 <sup>(3)</sup>	25 children	<i>Final Hearing Aid Choice</i>	- To investigate the effectiveness of a hearing aid containing two canals with low frequency of compression and high frequency of linear amplification of a children group that are in the school age using cochlear implants.	Transversal study
Kuk et al., 1999 <sup>(4)</sup>	20 children	<i>Listening Inventory For Education (LIFE)</i>	- To evaluate the effectiveness of a hearing aid with a directional microphone in children those are in the school age.	Transversal study
Purdy et al., 2002 <sup>(5)</sup>	23 children	<i>Auditory Behavior in Everyday Life (ABEL)</i>	- To develop a questionnaire to be answered by the hearing impairment children's parents about the changes in the auditory behavior with the daily implement of the amplification, reliable and easily quantifiable.	Transversal study
Freitas e Costa, 2007 <sup>(6)</sup>	31 children	Elaborated by the researcher herself	- To verify the difficulties related to the use and the batteries and ear mold management, also the amplification characteristics. - To argue about the several involved aspects in the adaptation process of the cochlear implants, guidance and accompaniment in this study group.	Transversal study
Ching and Hill, 2007 <sup>(8)</sup>	65 children	<i>Parent's Evaluation of Aural/Oral Performance of Children (PEACH)</i>	- To develop a subjective measure to quantify the effectiveness of the amplification in children in their daily routine, independently of their age and level of hearing loss.	Transversal study
Ching et al., 2010 <sup>(9)</sup>	48 children	<i>Parent's Evaluation of Aural/Oral Performance of Children (PEACH)/Teacher's Evaluation of Aural/Oral Performance of Children (TEACH)</i>	- To study judgments of speech intelligibility and daily performance children with hearing impairment using the hearing aids comparing the prescriptive rules NAL-NL1 and DSL.	Double-blind longitudinal study

therefore the analysis of its answers turns possible the accompaniment of the audiologic intervention, offering useful information about the efficiency of the hearing aids, going well with the objective evaluations.

In a different way of the literature about benefits and satisfaction of the amplification use in children, the literature about this same thematic in adults and aged is enough ample<sup>(10,11)</sup>. There is an increase need of evaluating not only clinical measures of effectiveness related to the communicative abilities, but also the involved aspects in the effectiveness of the treatment, as, for example, the satisfaction and the quality of life.

The questionnaires have become one of the main allies of the physicians to evaluate the benefits and the satisfaction regarding to the amplification use, therefore the results of the child auditory behavior and the parents' opinion about the amplification use are equally important to taking decisions. These decisions include the choice of the amplification and its adjustments, the therapeutical aims for the auditory and language abilities, the educational option and the need of interventions and/or devices of another origin<sup>(12,13)</sup>.

It is important to highlight that the ability of evaluating the associated satisfaction with the AASI used in children with hearing impairment is an important field of performance and research in the Educational Audiology area, once found the few studies in the literature about this thematic.

## CONCLUSION

The literature is scarce when considered the developed studies with the objective of validating questionnaires to the functional benefit evaluation and satisfaction in children regarding to the AASI use, making the subject an important investigation field.

*\*TMM and ADC were responsible for the data collection and tabulation; MFCGM has collaborated with the collection and tabulation and the supervising of the data collection; MANSM has followed the data collection and collaborated with the data analysis; RTSJ, ALMM and MCB were responsible for the project and delineation of the study and general orientation of the execution stages and the manuscript elaboration.*

## REFERENCES

1. Castiquini EAT, Bevilacqua MC. Escala de integração auditiva significativa: procedimento adaptado para a avaliação da percepção da fala. *Rev Soc Bras Fonoaudiol.* 2000;4(6):51-60.
2. Moeller MP, Hoover B, Peterson B, Stelmachowicz P. Consistency of hearing aid use in infants with early-identified hearing loss. *Am J Audiol.* 2009;18(1):14-23.
3. Bamford J, McCracken W, Peers I, Grayson P. Trial of a two-channel hearing aid (low-frequency compression-high-frequency linear amplification) with school age children. *Ear Hear.* 1999;20(4):290-8.
4. Kuk FK, Kollofski C, Brown S, Melum A, Rosenthal A. Use of a digital hearing aid with directional microphones in school-aged children. *J Am Acad Audiol.* 1999;10(10):535-48.
5. Purdy SC, Farrington DR, Moran CA, Chard LL, Hodgson SA. A parental questionnaire to evaluate children's Auditory Behavior in Everyday Life (ABEL). *Am J Audiol.* 2002;11(2):72-82.
6. Freitas CD, Costa MJ. Processo de adaptação de próteses auditivas em usuários atendidos em uma instituição pública federal – parte I: resultados e implicações com o uso da amplificação. *Braz J Otorhinolaryngol.* 2007;73(6):744-51.
7. Oshima M, Moret ALM, Amorim RB, Alvarenga KF, Bevilacqua MC, Lauris JRP, et al. Early Listening Function (ELF): adaptação para a Língua Portuguesa. *Rev Soc Bras Fonoaudiol.* 2010;15(2):191-6.
8. Ching TYC, Hill M. The Parent's Evaluation of Aural/Oral Performance of Children (PEACH) scale: normative data. *J Am Acad Audiol.* 2007;18(3):220-35.
9. Ching TYC, Scollie SD, Dillon H, Seewald R. A cross-over, double-blind comparison of the NAL-NL1 and DSL v4.1 prescriptions for children with mild to moderately severe hearing loss. *Int J Audiol.* 2010;49(Suppl 1):S4-S15.
10. Costa LP, Iório MCM. Próteses auditivas: avaliações objetivas e subjetivas em usuários de amplificação linear e não-linear. *Pró-Fono R Atual Cient.* 2006;18(1):21-30.
11. Farias RB, Russo ICP. Saúde auditiva: estudo do grau de satisfação de usuários de aparelhos de amplificação sonora individual. *Rev Soc Bras Fonoaudiol.* 2010;15(1):26-31.
12. Buzo BC, Ubrig MT, Novaes BC. Adaptação de aparelho de amplificação sonora individual: relações entre a auto-percepção do *handicap* auditivo e a avaliação da percepção de fala. *Distúrb Comun.* 2004;16(1):17-25.
13. Haskell GB, Noffsinger D, Larson VD, Williams DW, Dobie RA, Rogers JL. Subjective measures of hearing aid benefit in the NIDCD/VA Clinical Trial. *Ear Hear.* 2002;23(4):301-7.