

## Original Article

## Artigo Original

Marília Rodrigues Freitas de Souza<sup>1</sup>  
Ellen Osborn<sup>1</sup>  
Daniela Gil<sup>2</sup>  
Maria Cecília Martinelli Lório<sup>2</sup>

## Keywords

Hearing loss  
Hearing aids  
Rehabilitation of hearing impaired  
Questionnaires  
Child

## Descritores

Perda auditiva  
Auxiliares de audição  
Reabilitação de deficientes auditivos  
Questionários  
Criança

## Correspondence address:

Marília Rodrigues Freitas de Souza  
R. Botucatu, 802, Vila Clementino, São Paulo (SP), Brasil, CEP: 04023-062.  
E-mail: [marilia\\_mari@yahoo.com.br](mailto:marilia_mari@yahoo.com.br)

Received: 2/7/2011

Accepted: 6/6/2011

# Translation and adaptation of the ABEL – Auditory Behavior in Everyday Life questionnaire into Brazilian Portuguese

## *Tradução e adaptação do questionário ABEL – Auditory Behavior in Everyday Life para o Português Brasileiro*

## ABSTRACT

**Purpose:** To translate and adapt the ABEL – Auditory Behavior in Everyday Life – questionnaire into Brazilian Portuguese, and to establish the profile of auditory behavior in a group of children who use hearing aids. **Methods:** The ABEL questionnaire was translated and back translated. This version was compared to the original version regarding semantic equivalence, generating a new version in Portuguese. After that, 31 parents of children fitted with hearing aids answered an anamnesis and the Portuguese version of the ABEL questionnaire. The scores obtained were related to the variables investigated in the anamnesis. **Results:** Differences were found in the analysis of the aural-oral score for the variables degree of hearing loss and time of daily use of the hearing aid: children with milder degrees of hearing loss and/or children who use the hearing aid for longer periods showed better performances. There were also differences in total and auditory awareness scores for the variable time of daily use of the hearing aid, indicating that children who use their hearing aids for longer periods daily showed better performances. **Conclusion:** There was consistency between the versions generated during the translation of the questionnaire, allowing the formulation of its final version in Portuguese. Children with lower degrees of hearing loss and/or who use their hearing aids for longer periods have their daily activities less affected by the hearing loss. The ABEL questionnaire is an appropriate instrument to detail the development of auditory behaviors in children who use hearing aids.

## RESUMO

**Objetivo:** Traduzir e adaptar o questionário ABEL – *Auditory Behavior in Everyday Life* – para o Português Brasileiro e estabelecer o perfil do comportamento auditivo de crianças usuárias de aparelhos de amplificação sonora individual (AASI) por meio de sua aplicação. **Métodos:** Foi realizada a tradução do questionário ABEL, seguida pela retrotradução. Esta versão foi comparada à original em relação à equivalência semântica, sendo gerada uma nova versão em Português. A partir disso, foram entrevistados 31 pais de crianças adaptadas com AASI. Todos responderam a uma anamnese e à versão em Português do questionário ABEL. Os escores obtidos na aplicação do instrumento foram relacionados às variáveis investigadas na anamnese. **Resultados:** A análise do escore oral-aural revelou diferenças segundo as variáveis grau de perda auditiva e tempo de uso diário dos AASI, sendo que crianças com menores graus de perda e/ou que fazem uso dos AASI por mais tempo apresentam melhor desempenho. Em relação ao escore total e ao escore de consciência auditiva, houve diferenças segundo o tempo de uso diário dos AASI, indicando melhor desempenho daquelas que fazem uso dos AASI por mais tempo. **Conclusão:** Há coerência entre as versões geradas nas etapas de tradução do questionário, possibilitando a formulação de sua versão em Português. Crianças com menores graus de perda auditiva e/ou que referem maior tempo de uso diário de AASI têm suas atividades diárias menos comprometidas pela perda auditiva. O questionário ABEL é um instrumento apropriado para detalhar o desenvolvimento dos comportamentos auditivos de crianças usuárias de AASI.

Study conducted at the Department of Speech-Language Pathology and Audiology, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

(1) Graduate Program (Doctorate degree) in Human Disorders, Department of Speech-Language Pathology and Audiology, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

(2) Department of Speech-Language Pathology and Audiology, Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

## INTRODUCTION

The importance of investigating how the Auditory System receives, analyzes and organizes the acoustic information from the environment in children is due to the fact that changes arising from hearing loss in childhood restrict the experience in the beginning of life. That restriction modifies the auditory and language development, which interferes in the child's mental, social and educational development<sup>(1)</sup>. The diagnosis of hearing loss is essential to establish the conduct of rehabilitation, whether it started with the selection and fitting of hearing aid devices (AASI) or opting for the cochlear implant.

Whatever the choice is, it is necessary to measure the benefit resulting from the intervention. In the adult population, usually standardized instruments are used, which allow the evaluation of the benefit with the use of amplification and its comparison with data from literature and data from other patients. In Brazil, the use of these instruments for children is not widespread. Furthermore, its development is hampered by the children's auditory needs changes as time goes by, as well as the differences generated by the different degrees and configurations of loss<sup>(2)</sup>.

In other countries, the application of questionnaires to parents and caregivers to monitor the progress of auditory and verbal skills of the child is already a common practice. An example of this type of questionnaire is the Auditory Behavior in Everyday Life – ABEL<sup>(3)</sup>.

Knowing the advantages that the use of this type of instrument provides in the adaptation process of electronic hearing devices in the pediatric population, the objectives of this study were to translate and adapt the ABEL – Auditory Behavior in Everyday Life – questionnaire to Brazilian Portuguese and establish the auditory behavior of children who use the hearing aid devices (AASI) by its application.

## METHODS

This is a cross-sectional, descriptive study, conducted between June 2008 and May 2009, approved by the Research Ethics Committee of Universidade Federal de São Paulo (UNIFESP), under protocol number 1097/08. Took part of the survey parents/caregivers previously informed about the aims and methods of the study, and who authorized the use of data collected, signing the Free and Informed Consent Term. Initially, the ABEL questionnaire<sup>(3)</sup> was translated and adapted to Portuguese. This instrument aims to investigate the behavior of hearing in children from 4 to 14 years old, deaf, in their routine. The ABEL consists of 24 items whose sum of scores results in the total score. The issues are further divided into three factors: 11 related to oral-aural aspect, which checks the reception and auditory verbal response to sounds, ten related to consciousness and hearing environmental sounds and five relating to social skills, conversational and functional independence. Two of the 24 questions (questions 18 and 22) are found in two factors (oral-aural hearing and conscience). The average application time for this questionnaire is approximately 20 minutes. The step of translation and cultural adaptation was performed as

follows: two independent Brazilian translators, who knew the purposes of the study, conducted the translation of the instrument from English to Portuguese. Both versions have generated a unique version of translation, which was submitted to back translation (from Portuguese to English) by a speech-language pathologist who was unaware of the original instrument. This version was submitted to two professionals, speech-language pathologists with knowledge of English, to compare versions (original and back translated), about the semantic/idiomatic equivalence. The aim was to ensure the correct translation, and thus generate a new Portuguese version of the questionnaire.

After this, 31 parents/caregivers of children aged 4 years and 6 months to 13 years and 6 months, assisted at the Integrated Care, Research and Teaching of Hearing – NIAPEA from UNIFESP were interviewed. Children should meet the following eligibility criteria: hearing loss of sensorineural, conductive or mixed with mild to profound and make use of hearing aids bilaterally. We excluded children with obvious health problems that prevented observation of the activities listed in the questionnaire, such as mental retardation and/or other severe neurological impairments.

Initially, we did an interview with 31 responsible people (composed of an uncle, three grandparents, three fathers and 24 mothers of the patients), formulated by the researchers themselves, based on the interview guide used in the Children's Hearing Assessment Clinic of UNIFESP. In this interview, we tried to investigate personal data, data related to hearing loss (onset, duration, etiology, family history), time of intervention, daily use of hearing aids, school data and overall health. It was also performed consulting the medical records of each patient in order to detail the type and degree of hearing loss, its location (unilateral or bilateral), its characteristic (stable, progressive or fluctuating), the model and brand of hearing aid and the type of mold used.

After the interview, the translated and adapted questionnaire ABEL was orally applied. For each item respondents were to choose one of the following responses, according to the frequency of the referred behavior, showed by the child: never (0 points), almost never (1 point), occasionally (2 points), about half the time (3 points), often (4 points), almost always (5 points) and always (6 points). The higher the score, the better the child's performance for each of the aspects measured by the questionnaire, with the exception of questions 11 and 20, whose scores are reversed.

At the end, we performed a statistical analysis of data collected. The scores were related to the different variables studied in the interview and medical records, namely: degree of hearing loss, daily use of hearing aids, and whether or not the therapy approach was employed and the type of school attended by the child.

Qualitative variables were represented by absolute frequency (af) and relative (%), and quantitative as mild, median, standard deviation, first quartile, third quartile and confidence interval. In analyzing the data collected in the interview and the questionnaire, were used the following nonparametric tests: Equality of Two Proportions, Kruskal-Wallis and Mann-Whitney tests. The level of significance was set at 0.05 (5%) and all confidence

intervals presented throughout the work were built with 95% statistical confidence.

## RESULTS

### Translation and adaptation of the questionnaire ABEL – Auditory Behavior in Everyday Life – into Brazilian Portuguese

The original versions, translated and back translated from

the questionnaire ABEL – Auditory Behavior in Everyday Life – were compared and showed consistency, making it possible to obtain the final translated version of the instrument (Figure 1).

### Application from the questionnaire ABEL – Auditory Behavior in Everyday Life/CAAD

We tried to detail the sample by gender. We evaluated 13 (41.9%) female patients and 18 (58.1%) were male. Through the Equality of Two Proportions test, it was veri-

<b>Auditory Behavior in Everyday Life (ABEL)</b> Comportamento Auditivo nas Atividades Diárias (CAAD)				
Nome da criança: _____ Preenchido por: _____ Data: _____				
Instruções: Gostaríamos de saber como você observa o desenvolvimento auditivo de sua criança. Por favor, circule o número ao lado de cada item que melhor descreve o comportamento da criança durante a última semana.				
0 Nunca	1 Quase nunca	2 Ocasionalmente	3 Cerca de metade do tempo	
4 Frequentemente	5 Quase sempre	6 Sempre		
1. Inicia conversas com pessoas familiares.			0	1 2 3 4 5 6
2. Chama uma pessoa pelo nome para chamar sua atenção.			0	1 2 3 4 5 6
3. Diz “por favor” e “obrigado” sem ser lembrado.			0	1 2 3 4 5 6
4. Responde verbalmente ao cumprimentar familiares.			0	1 2 3 4 5 6
5. Inicia conversas com pessoas não familiares.			0	1 2 3 4 5 6
6. Respeita troca de turnos na conversação.			0	1 2 3 4 5 6
7. Atende ao telefone adequadamente.			0	1 2 3 4 5 6
8. Atende ao chamado de seu nome estando no mesmo ambiente.			0	1 2 3 4 5 6
9. Conversa utilizando uma intensidade normal de voz.			0	1 2 3 4 5 6
10. Solicita ajuda em situações necessárias.			0	1 2 3 4 5 6
11. Produz sons vocais inapropriados.			0	1 2 3 4 5 6
12. Demonstra interesse nas conversas que ocorrem em torno dele / dela.			0	1 2 3 4 5 6
13. Responde verbalmente ao cumprimento de pessoas não familiares.			0	1 2 3 4 5 6
14. Diz os nomes dos irmãos, membros da família e colegas de classe.			0	1 2 3 4 5 6
15. Atende a uma batida na porta ou campainha.			0	1 2 3 4 5 6
16. Sussura uma mensagem pessoal.			0	1 2 3 4 5 6
17. Fica em silêncio quando solicitado.			0	1 2 3 4 5 6
18. Pergunta sobre sons que escuta a sua volta (ex: aviões, caminhões e animais).			0	1 2 3 4 5 6
19. Reconhece quando produz sons intensos (por exemplo, batidas de porta, batidas de pé).			0	1 2 3 4 5 6
20. Ignora o toque do telefone.			0	1 2 3 4 5 6
21. Brinca cooperativamente em um pequeno grupo sem supervisão de adultos.			0	1 2 3 4 5 6
22. Canta.			0	1 2 3 4 5 6
23. Sabe quando as próteses auditivas não estão funcionando.			0	1 2 3 4 5 6
24. Faz experiências com sons recém descobertos.			0	1 2 3 4 5 6

**INSTRUÇÕES PARA A PONTUAÇÃO (para uso da clínica):**  
 Escores reversos para as questões 11 e 20.  
 Some as respostas e divida por 24 para obter o escore total.  
**Oral-aural** Fator 1 =  $(1 + 2 + 3 + 4 + 10 + 12 + 13 + 14 + 18 + 21 + 22)/11$   
**Consciência auditiva** Fator 2 =  $(7 + 8 + 15 + 16 + 18 + 19 + 20 + 22 + 23 + 24)/10$   
**Habilidades Sociais/de Conversação** Fator 3 =  $(5 + 6 + 9 + 11 + 17)/5$

**Figure 1.** Version of the ABEL – Auditory Behavior in Everyday Life – questionnaire, translated and adapted into Portuguese 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 [por] Marília Rodrigues Freitas de Souza, Daniela Gil, Hellen Osborn, Maria Cecília Martinelli Iório

fied that there was no difference in gender ratio ( $p=0.204$ ). We analyzed the quantitative variables related to age and score of the questionnaire (total, oral-aural, hearing awareness and social skills and conversation). Patients had an average age of  $104.3 \pm 33.3$  months. As for the scores, they showed an average punctuation of  $3.87 \pm 1.24$  for the total score,  $4.10 \pm 1.23$  for the oral-aural score,  $4.04 \pm 1.52$  for the score of conscience hearing and  $3.03 \pm 1.42$  for the score of social skills and conversation. The sample was distributed according to the degree of hearing loss presented by the children. Of the participants, nine (29.0%) had hearing loss of mild or moderate level, ten (32.3%) had hearing loss severe or moderately severe and 12 (38.7%) had profound hearing loss. Analysis was performed with the aim of comparing the total score and each of the three specific scores according to the degree of hearing loss presented by the children (Table 1).

It is possible to verify that there was a difference at the score for the oral-aural, being the children with lesser degrees of hearing loss the ones who showed better performance in the questionnaire.

The sample was divided into two groups according to the daily use of hearing aids reported by parents. Of the partici-

pants, ten (32.2%) made use of hearing aids for less than 10h/day and 21 (67.7%) used hearing aids for a time equal to or greater than 10h/day. Analysis was performed with the aim of comparing the total score and each of the three specific scores with the daily use of hearing aids for children (Table 2).

You can check that there were differences when comparing the time use of hearing aids with the points obtained on total scores, oral-aural and ear consciousness. Note that children who use hearing aids for most of the time every day had higher scores.

After that, the sample was divided into two groups according to the production or not of speech therapy (current or previous). Of the patients, five (16.1%) have never done therapy and 26 (83.9%) had previously made or performed speech therapy. An analysis was made with the aim of comparing the total score and each of the three specific scores between the groups (Table 3).

The 26 children (83.9% of total) who performed or perform speech therapy were divided into two groups, according to the therapeutic approach used. Of these, 18 (69.2%) attended therapy with aural approach and eight (30.8%) attended different therapy approaches (LIBRAS, verb tone, total communication). Comparisons were made between the obtained scores (total

**Table 1.** Descriptive measures and comparison of scores according to the degree of hearing loss

	Degree	Mean	Median	SD	Q1	Q3	n	CI	p-value
Total score	Mild/Mod	4.52	4.5	0.47	4.2	4.8	9	0.31	0.082 <sup>#</sup>
	Mod Sev/Severe	4.14	4.3	0.71	3.7	4.5	10	0.44	
	Profound	3.17	3.4	1.63	2.0	4.4	12	0.92	
Oral-aural	Mild/Mod	4.88	4.8	0.35	4.7	5.0	9	0.23	0.021*
	Mod Sev/Severe	4.31	4.3	0.89	3.8	4.8	10	0.55	
	Profound	3.33	3.5	1.48	2.0	4.4	12	0.84	
Auditory consciousness	Mild/Mod	4.67	4.8	0.56	4.4	5.1	9	0.37	0.219
	Mod Sev/Severe	4.44	4.4	1.00	3.8	5.3	10	0.62	
	Profound	3.24	3.6	2.03	1.5	4.7	12	1.15	
Social skills/conversation	Mild/Mod	3.40	3.8	1.48	2.8	4.6	9	0.97	0.559
	Mod Sev/Severe	3.06	3.0	1.12	2.5	3.6	10	0.69	
	Profound	2.72	3.1	1.63	1.6	3.9	12	0.92	

\* Significant values ( $p \leq 0.05$ ) – Kruskal-Wallis test

<sup>#</sup> Values next to the level of significance ( $p \leq 0.05$ ) – Kruskal-Wallis test

**Note:** Mod = moderate; Mod Sev = moderately severe; Q1 = 1st quartile; Q3 = 3rd quartile; CI = confidence interval; SD = standard deviation

**Table 2.** Descriptive measures and comparison of scores according to the daily use of hearing aids

	Usage time	Mean	Median	SD	Q1	Q3	n	CI	p-value
Total score	<10h/day	3.31	3.5	1.19	2.7	4.2	10	0.74	0.021*
	$\geq 10$ h/day	4.14	4.4	1.20	3.8	4.9	21	0.51	
Oral-aural	<10h/day	3.51	3.7	1.22	2.7	4.5	10	0.75	0.045*
	$\geq 10$ h/day	4.38	4.7	1.16	3.8	5.3	21	0.49	
Auditory consciousness	<10h/day	3.36	3.8	1.41	2.9	4.5	10	0.88	0.033*
	$\geq 10$ h/day	4.37	4.8	1.49	3.8	5.4	21	0.64	
Social skills/conversation	<10h/day	2.58	2.8	1.33	1.9	3.3	10	0.83	0.196
	$\geq 10$ h/day	3.24	3.6	1.44	2.4	4.6	21	0.62	

\* Significant values ( $p \leq 0.05$ ) – Mann-Whitney test

**Note:** Q1 = 1st quartile; Q3 = 3rd quartile; CI = confidence interval; SD = standard deviation

each of the three specific scores) in these groups (Table 4).

There was no difference when comparing the approach used in therapy and the different scores.

Finally, the sample was divided into two groups according to the type of school attended by children. One of the children did not go to school and was excluded from this analysis. Of the participants, six (20.0%) attended special school for hearing impaired and 24 (80.0%) attended regular school. The scores (total and each of the three specific scores) were compared to the type of school attended (Table 5).

There was no difference in comparing the type of school and the different scores.

## DISCUSSION

### Translation and adaptation of the ABEL questionnaire – Auditory Behavior in Everyday Life – into Brazilian Portuguese

Regarding the translation and adaptation of the questionnaire into Portuguese, there was consistency between the original, back-translated and the final questionnaire versions. Few difficulties were encountered. The biggest one was related to the translation of question 16: *Will whisper a personal message*, in which, according to Michaelis Dictionary English-Portuguese,

**Table 3.** Descriptive measures and comparison of scores obtained according to the performance of speech therapy

	Therapy	Mean	Median	SD	Q1	Q3	n	CI	p-value
Total score	Never	3.63	3.6	1.53	3.3	4.8	5	1.34	0.768
	Yes	3.92	4.3	1.21	3.6	4.6	26	0.46	
Oral-aural	Never	3.73	3.7	1.39	2.6	4.8	5	1.22	0.519
	Yes	4.17	4.5	1.21	3.8	4.9	26	0.47	
Auditory consciousness	Never	3.66	4.5	1.94	3.4	4.8	5	1.70	0.648
	Yes	4.12	4.4	1.46	3.6	5.3	26	0.56	
Social skills/conversation	Never	2.84	2.8	1.65	1.8	3.8	5	1.44	0.829
	Yes	3.06	3.3	1.41	2.3	4.1	26	0.54	

Mann-Whitney test ( $p \leq 0.05$ )

**Note:** Q1 = 1st quartile; Q3 = 3rd quartile; CI = confidence interval; SD = standard deviation

**Table 4.** Descriptive measures and comparison of scores obtained according to the approach used in therapy

	Approach	Mean	Median	SD	Q1	Q3	n	CI	p-value
Total score	Other	4.26	4.5	1.11	4.0	4.9	8	0.77	0.133
	Aurioral	3.77	4.2	1.25	3.6	4.4	18	0.58	
Oral-aural	Other	4.36	4.8	1.32	4.0	5.3	8	0.91	0.389
	Aurioral	4.08	4.4	1.19	3.8	4.7	18	0.55	
Auditory consciousness	Other	4.43	4.9	1.47	3.9	5.5	8	1.02	0.373
	Aurioral	3.98	4.3	1.48	3.6	4.8	18	0.68	
Social skills/conversation	Other	3.50	3.6	1.19	3.2	4.0	8	0.82	0.316
	Aurioral	2.87	2.8	1.48	1.9	4.1	18	0.68	

Mann-Whitney test ( $p \leq 0.05$ )

**Note:** Q1 = 1st quartile; Q3 = 3rd quartile; CI = confidence interval; SD = standard deviation

**Table 5.** Descriptive measures and comparison of scores according to the type of school attended by children

	Type of school	Mean	Median	SD	Q1	Q3	n	CI	p-value
Total score	Special	3.45	4.3	2.16	1.7	5.0	6	1.73	0.959
	Regular	4.09	4.3	0.78	3.6	4.6	24	0.31	
Oral-aural	Special	3.83	4.5	1.99	2.3	5.3	6	1.59	0.979
	Regular	4.25	4.5	0.94	3.8	4.8	24	0.38	
Auditory consciousness	Special	3.37	4.1	2.29	1.5	5.2	6	1.83	0.516
	Regular	4.36	4.5	1.04	3.8	5.1	24	0.42	
Social skills/conversation	Special	2.97	3.9	2.11	1.4	4.5	6	1.69	0.835
	Regular	3.13	3.0	1.20	2.4	3.8	24	0.48	

Mann-Whitney test ( $p \leq 0.05$ )

**Note:** Q1 = 1st quartile; Q3 = 3rd quartile; CI = confidence interval; SD = standard deviation

*whisper* means “*cochicho*”, “*murmúrio*”, “*sussurro*”, and *personal message* means “*mensagem pessoal*”. Thus, the final item was translated as “*sussurra uma mensagem pessoal*”. Nevertheless, the item was not well understood by parents and, as the questionnaire was administered orally, explanations and substitutions were possible for the synonym “whisper”.

Other items that brought questions of understanding and interpretation, not because of the translation, but for the unusual vocabulary were the item 6 (“*respeita troca de turnos na conversação*”), 11 (“*produz sons vocais inapropriados*”) and 24 (“*faz experiências com sons recém descobertos*”). These issues needed, for some times, the substitution of terms for synonyms and explanations of meaning.

Although an apparently simple and direct questionnaire, the fact that it has seven response options for each of the issues, hinders its application. To clarify what would be the degree of frequency of occurrence, it was explained to participants that the aim was that they scored how often each of the behaviors mentioned in the questionnaire occurred in one week. To avoid forgetting the response options they had, they were offered a board, in paper board, containing the seven options. The questions were made orally, but access to the answers could be remembered for the entire application of the instrument.

#### **Application of the questionnaire ABEL – Auditory Behavior in Everyday Life/Comportamento Auditivo nas Atividades Diárias (CAAD)**

The data resulting from application of the questionnaire ABEL/CAAD showed the following average scores: total of 3.87 points; oral-aural of 4.10 points, to 4.04 points auditory awareness, and social skills and conversation 3.03 points. Thus, comparing the four scores, the deaf children showed lower scores for social skills. This fact is due to language deprivation, discouragement of independence and responsibility, and the lack of incidental learning<sup>(4)</sup>. Children need models to learn about socially acceptable behavior, but the difficulty in communicating of deaf prevents them from getting accurate, consistent and complete explanation to develop the perception of what is required of them.

By relating the performance of children in the questionnaire with the degree of hearing impairment presented by them, we find differences in oral-aural score, for which children with lesser degrees of hearing loss showed better performance.

During the ABEL questionnaire in its first version<sup>(3)</sup>, still with 49 items, were found the worst performances in children with hearing loss, from severe to profound degrees when compared to children with hearing losses from mild to moderate, a finding similar to that obtained in this study. Because the present cited research presents other objectives (analysis of the reliability of the instrument), there was no detail of the score obtained for each score. In literature, there are no other studies with the ABEL questionnaire that have made similar comparison. Researches were found that used other scales to compare the score of hearing children and children with hearing impairment, which found that the latter had lower performance in subjective measures of auditory behavior and language<sup>(5-8)</sup>.

Other studies also point to significant differences in language, also measured by subjective instruments, depending on the degree of hearing loss presented by the children, and found better performance in children with lesser degrees of loss<sup>(8,9)</sup>.

As for the daily use of hearing aids, other research has considered this factor in the development of auditory abilities in children with some degree of hearing loss. One study indicates that some factors may be related to better adaptation to the individual hearing aids<sup>(10)</sup>. According to these authors, children with loss of between 50 and 90 dBHL use hearing aid more often. In this study, we obtained findings consistent with this statement: of the 21 children whose parents reported time use of hearing aids equal to or above ten hours a day, 12 (57.1%) had hearing loss of moderate to severe – in the range of 50 to 90 dBHL. In the cited research, 19% of children did not make constant use of hearing aids, value lower than the found in this study (32.2%).

Other research also considered the same factor in the development of auditory skills of children with some degree of loss<sup>(11)</sup>. Through a self-assessment questionnaire, the authors found that 63% of deaf people used hearing aids in all the places they frequented, removing them only to shower and sleep, lower than that of the present study (67.7%).

In a research conducted on 12 children who used hearing aids, it was verified that five of them (41.7%) used hearing aid for 11 to 15 hours a day, three (25.0%) for 6 to 10 hours, three (25.0%) for 1-5 hours and one (8.3%) for less than one hour<sup>(12)</sup>. The present study showed higher percentages of children whose parents or guardians reported making use of hearing aids more constantly (67.7%).

Also in the present study, we found differences when comparing the daily use of hearing aids with the individual scores on the ABEL/CAAD questionnaire for total scores, oral-aural and ear consciousness. It was found in all analysis that those who used hearing aids for longer periods daily had higher scores.

These results are consistent with the idea that sound amplification devices enable an improvement in auditory input, and consequently an improvement in the behavior in daily activities (measured by total score), in factor aural-oral (receive and react to sound, making use of oral form of communication) and the factor of consciousness hearing (to differentiate the presence and absence of sounds). For the improvement of auditory skills, language and social some care is needed, such as the correct use of hearing aids. So that they can assist the hearing impaired, it is necessary to keep them running smoothly and in continuous use. If the individual hearing aids are not used regularly, the child will receive interrupted information from the sound world, which will hinder the development of auditory, speech and language functions<sup>(13)</sup>.

As for the realization of speech therapy, it is important that such activity ensures the improvement of all aspects (aural-oral, auditory awareness and social skills/conversation) that interfere with auditory behavior in daily activities (total score). However, the analysis of the interference of this variable on the behavior of the children studied showed no differences. Besides the ABEL questionnaire, other instruments may be used to assess the benefits achieved in the therapy of children

with hearing impairment, whether if they are users of hearing aids or cochlear implants. As an example, we can mention a study that assessed the efficacy of the cochlear implant use and speech therapy in children under one year of age, through the application of IT-MAIS – Infant Toddler Meaningful Auditory Integration Scale – questionnaire to parents of children before surgery, three months, six months and every six months until it reached a maximum level of response. Were also applied reception and understanding of phonemes tests, words and sentences when appropriate. Substantial improvement was observed for all 18 children in the IT-MAIS results, comparing the responses given preoperatively, while making use of hearing aids on the condition after six months of cochlear implant surgery. Thus, the combination therapy influences the adaptation of the implant in improving the performance measured by questionnaire<sup>(14)</sup>, which was not observed in this study, using the translated instrument.

Regarding the approach used in current or previous therapy, there was no difference between the different scores analyzed according to this variable. In the literature, it is assumed that the approach used in speech therapy for hearing impaired should be considered on a case by case basis, taking into consideration various aspects such as degree of hearing loss, the time of installation, etiology, diagnosis and age at onset of rehabilitation, family aspects, among others. Thus, there is a number of variables that can interfere with the best use of a particular therapeutic approach for a child<sup>(15)</sup>.

The aural therapeutic approach will provide the best possible development in the light, among other factors, of the degree of hearing loss. The lower the degree of loss, the better the performance of children with hearing aid devices, because the benefit from amplification allows the speech signal to be received properly<sup>(13)</sup>. In children with greater degrees of hearing loss, even with satisfactory gain with hearing aids, often the speech signal is still not adequately presented, which makes difficult the exclusive use of the oral stimulation therapy. In these cases, the child is expected to benefit from other therapeutic modalities, such as sensory and gestural. In this study, for all cases in which it was used another type of therapy, except in one child, the degree of hearing loss diagnosed in the better ear was between severe and profound.

Besides the question of the degree of hearing loss, one can consider that parents, when they begin the therapeutic process approach, may have a high expectation of speech and language development of children. They may want their children to quickly reach expressive and receptive vocabulary goals similar to those of hearing children, which does not always occur and eventually frustrate them. The low scores obtained on the instrument may be a result of this frustration.

No studies were found with the questionnaire used in this research, or other similar instruments, which were designed to compare different proposals for teaching and auditory behavior in daily activities.

There was no difference when analyzing the different scores in relation to the type of school attended by children. It is noteworthy that these findings allow us to examine how appropriate resources provided by the current inclusive education

policy are, promoting the organization of regular classes and specialized educational support services<sup>(16)</sup>. More than that, it puts into question whether if the barriers of communication are being eliminated, ensuring deaf people the access to information and education, pointing to the Law No. 10,098 of 2000<sup>(17)</sup>.

After detailing the findings and discussing, we can say that the questionnaire / CAAD proved to be an appropriate tool to evaluate the development of auditory behaviors of children who used hearing aid devices, providing useful information to the speech-language pathologist working with hearing rehabilitation.

## CONCLUSION

After reviewing the results of this study, we can conclude that there is consistency between the generated versions at different stages of translation of the questionnaire, allowing the formulation of the final version in Portuguese. The lower the degree of hearing loss presented by the children, the better the performance measured by the questionnaire for oral-aural score, that is, the better a child's abilities to receive sound information and respond to them orally. The higher the daily use of individual hearing aids, the better the performance measured by total scores on the questionnaire, and oral-aural ear consciousness. Thus, the continued use of individual hearing aids contributes to the child succeed in their daily activities, being able to receive, retain and become aware of the sound information, and communicate dependent on such capabilities. The social and conversational skills were not influenced by any of the factors studied in the clinical history.

## REFERENCES

1. Azevedo MF. Avaliação audiológica no primeiro ano de vida. In: Lopes Filho OC. Tratado de Fonoaudiologia. São Paulo: Roca; 1997. p. 239-63.
2. Iório MC, Menegotto IH. Seleção e adaptação de próteses auditivas em crianças. In: Ferreira LP, Befi-Lopes DM, Limongi SC. Tratado de Fonoaudiologia. São Paulo: Roca; 2004. p. 680-93.
3. 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.
4. Domingues AF, Motti TF, Palamin ME. O brincar e as habilidades sociais na interação da criança com deficiência auditiva e mãe ouvinte. *Estud Psicol.* 2008;25(1):37-44.
5. Kishon-Rabin L, Taitelbaum-Swead R, Ezrati-Vinacour R, Hildesheimer M. Prelexical vocalization in normal hearing and hearing-impaired infants before and after cochlear implantation and Its relation to early auditory skills. *Ear Hear.* 2005;26(4 Suppl):17S-29S.
6. Wang NY, Eisenberg LS, Johnson KC, Fink NE, Tobey EA, Quittner AL, et al. Tracking development of speech recognition: longitudinal data from hierarchical assessments in the Childhood Development after Cochlear Implantation Study. *Otol Neurotol.* 2008;29(2):240-5.
7. Rinaldi P, Caselli C. Lexical and grammatical abilities in deaf Italian preschoolers: the role of duration of formal language experience. *J Deaf Stud Deaf Educ.* 2009;14(1):63-75.
8. Vohr B, Jodoin-Krauzyk J, Tucker R, Johnson MJ, Topol D, Ahlgren M. Early language outcomes of early-identified infants with permanent hearing loss at 12 to 16 months of age. *Pediatrics.* 2008;122(3):535-44.
9. Pipp-Siegel S, Sedey AL, VanLeeuwen AM, Yoshinaga-Itano C. Mastery Motivation and Expressive Language in young children with hearing loss. *J Deaf Stud Deaf Educ.* 2003;8(2):133-45.

10. Marttila TI, Karikoski JO. Hearing aid use in Finnish children – impact of hearing loss variables and detection delay. *Int J Pediatr Otorhinolaryngol.* 2006;70(3):475-80.
11. Boscolo CC, Costa MP, Domingos CM, Perez FC. Avaliação dos benefícios proporcionados pelo AASI em crianças e jovens da faixa etária de 7 a 14 anos. *Rev Bras Educ Espec.* 2006;12(2):255-68.
12. Couto MI, Lichtig I. Efeitos da amplificação sonora sobre as modalidades comunicativas utilizadas pelos pais. *Pró-Fono.* 2007;19(1):75-86.
13. Bevilacqua MC, Formigoni GM. Audiologia educacional: uma opção terapêutica para a criança deficiente auditiva. Barueri: Pró-Fono; 1998.
14. Waltzman SB, Roland JT Jr. Cochlear implantation in children younger than 12 months. *Pediatrics.* 2005;116(4):e487-93.
15. Margall SA, Honora M, Carlovich AL. A reabilitação do deficiente auditivo visando qualidade de vida e inclusão social. *Mundo Saúde.* 2006;30(1):123-8.
16. Farias SB. As tecnologias da informação e comunicação e a construção do conhecimento pelo aluno surdo [tese]. João Pessoa: Universidade Federal da Paraíba; 2006.
17. Guarinello AC, Berberian AP, Santana AP, Massi G, de Paula M. A inserção do aluno surdo no ensino regular: visão de um grupo de professores do Estado do Paraná. *Rev Bras Educ Espec.* 2006;12(3):317-30.