Analysis of informative material stored in DVD in the hearing aid adaptation of elderly users

Análise de material informativo em DVD na adaptação de idosos usuários de aparelho de amplificação sonora individual

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ABSTRACT

Purpose: To verify the effectiveness of the DVD "Knowing and Learning about my Hearing Aid" as a tool in the hearing aid (HA) adaptation process in the elderly. **Methods:** A total of 27 individuals, divided in two groups, participated in this study: a control group, which received the audiological guidance and the technical instruction manual accompanying the adapted behind-the-ear hearing aids; and an experimental group, which received the same guidance as the control group, plus the DVD. The effectiveness of the DVD was measured through a specific tool that evaluates the skills to manipulate the HA, the Practical Hearing Aid Skills Test, using descriptive statistics analysis and the non-parametric Mann-Whitney test. **Results:** The experimental group obtained a better performance in the tasks of cleaning the hearing aid and the earmold, manipulating the volume control, handling the telecoil and correctly placing the phone in the ear. No difference was found between the performances of the control group and the experimental group in the Practical Hearing Aid Skills Test. Most of the experimental group affirmed to be very satisfied with the information stored in the DVD. **Conclusion:** An improvement trend was observed in the experimental group regarding the understanding of the content about the HA, due to the use of the DVD, and a high level of satisfaction was observed among the participants of this group with the tool, which confirms such material is a tool possible to be used during the HA adaptation process.

Keywords: Aging; Hearing aids; Telemedicine; Hearing loss; Education, distance

RESUMO

Objetivo: Verificar a eficácia do DVD "Conhecendo e Aprendendo sobre meu Aparelho Auditivo" como ferramenta no processo de adaptação do aparelho de amplificação sonora individual (AASI) em idosos. **Métodos:** Participaram dessa pesquisa 27 indivíduos, divididos em dois grupos: grupo controle, que recebeu as orientações fonoaudiológicas e o manual técnico de instruções que acompanhava o AASI retroauricular adaptado; e grupo experimental, que recebeu as mesmas orientações do grupo controle, acrescidas do referido DVD. A eficácia do DVD foi mensurada por meio do instrumento específico de habilidades de manuseio com o AASI *Practical Hearing Aid Skills Test*, usando-se análise estatística-descritiva e o teste não paramétrico de Mann-Whitney. **Resultados:** O grupo experimental obteve melhor desempenho nas tarefas de limpeza do AASI e molde auricular, manipulação do controle de volume, manuseio da bobina telefônica e posicionamento correto do telefone na orelha. Não houve diferença entre os desempenhos do grupo controle e grupo experimental, no *Practical Hearing Aid Skills Test*. A maioria do grupo experimental afirmou estar muito satisfeita com as informações contidas no DVD. **Conclusão:** Foi observada tendência de melhora, no grupo experimental, quanto à compreensão do conteúdo sobre o AASI, devido ao uso do DVD e elevado grau de satisfação desse grupo com o instrumento, confirmando ser um material possível de ser utilizado durante o processo de adaptação do AASI.

Descritores: Envelhecimento; Auxiliares de audição; Telemedicina; Perda auditiva; Educação a distância

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INTRODUCTION

The elderly population has been increasing worldwide and the hearing impairment is present in a large part of this population. Although there is a significant number of individuals with this problem, many of them postpone or avoid, for some reason, the acquisition of the Hearing Aid (HA)[1,2].

The difficulty in manipulating such device is one of the recurring reasons that hinder the use of the HA[3]. Besides that, this population presents more difficulty in understanding the information because of declining age, which, most often, makes this process slower and more complex. In this context, it is important to mention the time spent, the language used and the age of the individual are some of the aspects that will interfere with the retention of the information transmitted[4].

Therefore, to carry out a follow-up of individuals who acquired HA through SUS and serve them in all their needs becomes a hard task, considering the geographic size of Brazil and its people and, mainly, the heterogeneity in the distribution of health professionals, including speech language pathologists[5].

Considering such reality, the Tele-education in Brazil arises as a relevant strategy to help fulfill the demand needs[6]. It is an additional opportunity the patient has to have access, as many times as necessary, to the information given in the appointment with the speech-language pathologist. The way such information is presented is essential not only for the assimilation but also for the understanding of the individual[4,7,8].

This strategy shows to be important because the time spent to provide the information and the guidance about the use, cares and manipulation of the HA is 42 minutes[9]; this time can be smaller, about 15 and 20 minutes[10]. The fact gets even more worrying with the knowledge that the understanding of the information provided can become even more difficult for new users of HA, mainly for those who have the age factor associated with deficits in the working memory[11]. Furthermore, it is also known that after the guidance is provided, the individual immediately remembers only 80% of the content said and that, after the first month, the individual retains 77% of the information provided[12].

Therefore, it is important to use the Tele-education resources to develop educational materials for the hearing impaired and their families aiming to add a reinforcement to the information about the HA use and manipulation, so that they can access such information whenever they judge necessary. The DVD is an audiovisual resource that helps the users to retain the information obtained in the health professional`s office[7,13,14].

In order to minimize the difficulties found by HA users in the use of the device, some initiatives have arisen based on Tele-education proposals. The DVD "Knowing and Learning about my Hearing Aid" was developed to help the hearing impaired elderly with no previous experience in the HA adaptation process. This educational material addressed aspects about cares, use and maintenance of the HA[3].

Thus, this study objective is to verify the effectiveness of the DVD "Knowing and Learning about my Hearing Aid" Volume 2[13] in the adaptation process of the behind-the-ear HA of the hearing impaired elderly.

METHODS

This study integrated the Research Line Telehealth in Speech-Language and Hearing Sciences of the Department of Speech-Language Pathology and Audiology, Bauru School of Dentistry, Universidade de São Paulo (USP), with the approval of this institution's Ethics Committee under the Protocol No 033/2007. All participants agreed to take part of the study and signed a Consent Form.

Casuistry

In order to verify the effectiveness of the educational material, 27 elderly individuals were selected and divided into two groups: a control group, comprised of 14 individuals and an experimental group, comprised of 13 individuals. The inclusion criteria were: sensorineural hearing impairment, mixed or conductive, mild/moderate; bilateral and/or unilateral involvement; age between 60 and 91; new users of behind-the-ear Hearing Aid, with different types of earmold, made in silicone and acrylic materials. Regarding the exclusion criteria, the following were established: unsatisfactory speech understanding; unavailability to return in a month; hindered manual dexterity; memory alteration and open-fit adjustment of the behind-the--ear hearing aids.

Materials

For both groups (control and experimental), the PHAST (Practical Hearing Aid Skills Test)[11], translated to Brazilian Portuguese, was applied when the user came for the maintenance of the HA in order to verify the retaining of the information provided. The instrument PHAST is a way to objectively obtain the ability the HA user has to manipulate the HA functions and keep the device appropriately clean[15].

Such instrument was used by another speech-language pathologist, appropriately trained, who did not know if the individual had taken home or not the educational material. Three different professionals, who work in the area of amplification, were trained in the application of the questionnaire so that there was no bias in the methodology, with difference between the evaluators. These professionals attended the adapted individuals when they returned, after a month of adaptation. This instrument presents some tasks related to the use and manipulation of the HA. These tasks are requested by the speech-language pathologist, who scores the performance of such tasks by the user. The aspects included are the following:

(1) Inserting the HA: (a) ability to hold and (b) insert the device in the ear;
(2) Removing the HA: (a) ability to hold and (b) remove the devices from the ear;
(3) Opening the battery compartment: (a) locate the compartment and (b) open the battery compartment;
(4) Changing the battery: remove the old battery and (b) insert the new battery;
(5) Cleaning: in this study, the cleaning of the earmold was considered instead of the cleaning of the HA;
(6) Manipulating the volume control;
(7) Using the phone: correct use of the software or telecoil and (b) placement of the phone related to the ear;
(8) Using the directional microphone or the noise software: this aspect was not considered in this study as the individuals who had such feature in the adapted HA would receive this guidance afterwards.

The instrument presents five options to classify the participant`s resourcefulness: "excellent" (four points), "more than satisfactory" (three points), "satisfactory" (two points), "less than satisfactory" (one point) and "unable to perform" (zero point).

The highest score of the questionnaire is 32 as it consists of eight tasks whose highest scores are 4 each. To obtain the score, all points are summed, reaching the gross score. To obtain the total score, in percentage, the number obtained is divided by the number of highest possible points, considering the tasks evaluated and, afterwards, this number is multiplied by 100 to reach the percentage that is classified as:

- Excellent: 90% to 100%
- Good: 80 to 89%
- Satisfactory: 65% to 79%
- Unsatisfactory: Less than 65%

A multiple choice questionnaire, evaluating how much the information on the DVD helped the individual, was applied only to the experimental group when they came to do the maintenance and the follow up of the HA. The questionnaire consisted of two parts. The first part was about the amount of knowledge the DVD provided and the second part consisted of a question on the satisfaction regarding the information received.

Procedures

Control Group

At the time of the HA adaptation, this group participants received guidance about the "HA/earmold' through traditional methods (audiological guidance and a technical instruction manual of the adapted HA model), but with no loss of content and/or quality of the guidance.

Experimental group

Also at the time of the HA adaptation, this group participants received guidance on the "HA/earmold" through traditional methods (a technical instruction manual of the adapted HA model and verbal audiological guidance) and, in addition, they received the DVD "Knowing and Learning about my Hearing Aid" Volume 2 to consult at home.

The individuals in this group received the educational material for free and kept it with them for a period of 30 days so that they could use it. When they returned, the patients told the researcher, before being attended by the speech-language pathologist, how many times they had watched the DVD in order to clarify doubts.

The guidance was given by the same speech-language pathologist (so that the meetings were standardized) and, after a month of adaptation, the individuals of the control and experimental group returned for the procedure of maintenance and follow up of the HA, with the same professional, and that was when the evaluation instrument Practical Hearing Aid Skills Test (PHAST) was applied.

It is important to mention that the process of audiological guidance concerning the use, care and manipulation of the HA/earmold was planned and followed the literature[10]; it was adapted to the specificities of the cases that were attended. Besides that, the training with the participants about the HA and the earmold, during the guidance process, occurred so that the users from both groups learned, from the first moment, to deal with this amplification device.

Statistical analysis

The results of the Evaluation Protocol of the DVD "Knowing and Learning about my Hearing Aid" and the questions addressed by the instrument PHAST to evaluate the use and the care with the HA were analyzed through descriptive statistics.

The comparison of the total score obtained by the instrument PHAST, between the control group and the experimental group, expressed in percentage, was analyzed through the nonparametric statistical Mann-Whitney test, adopting a significance level of 0.05.

The methodology adopted in this study is represented in Figure 1.

RESULTS

Regarding the comparison of the performance results of the control and experimental groups, obtained by the Evaluation Instrument PHAST, the tasks selected were the ones whose results showed more discrepancy in the groups evaluated and the highest difficulties presented by the participants of each group. Among the participants of the experimental group, 69.23% (9) obtained an excellent performance against 42.86% (6) of the control group that had the same performance in the task of removing the HA from the ear. On the other hand, 64.29% (9) were excellent in the task of inserting the HA in the ear, while

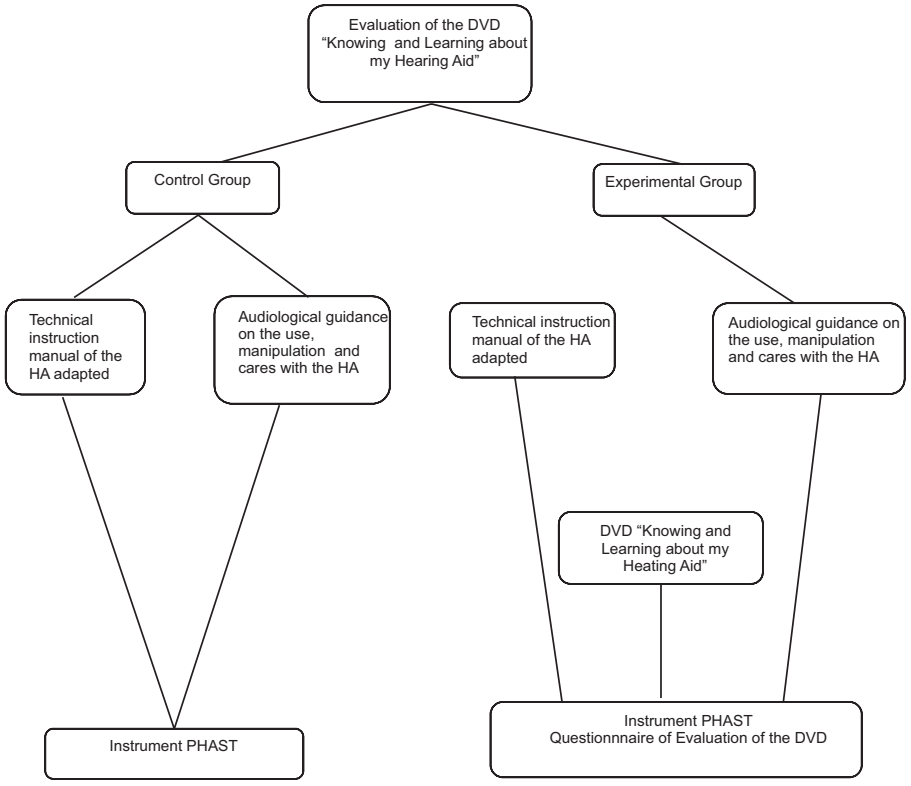

Figure 1. Methodology of the study

38.46% (5) of the experimental group obtained this result.

Regarding the cleaning of the HA earmold, 53.85% of the participants of the experimental group (7) had an excellent performance, while, in the control group, this percentage was of 35.71% of the participants (5). The percentage of those who were unable to perform such task was of 7.69% in the experimental group and 14.29% in the control group.

With regard to the manipulation of the volume control, there was proximity in the percentages of the participants that obtained excellent results, in the control and experimental groups, 28.75% and 33.33%, respectively. However, some individuals presented difficulty in performing this task, 35.71% of the participants of the control group were unable to manipulate the volume control, while 22.22% of the participants of the experimental group presented a similar result. In this context, it is important to emphasize that, both in the control group and in the experimental group, there were HA users with volume control (9 participants and 14 participants, respectively).

Regarding the telecoil, 9.09% of the participants of the control group performed the task of manipulating it with excellence, against 37.50% of the participants of the experimental group that had such performance. The percentage of those who were unable to manipulate the telecoil was of 54.55% of the control group, against 37.50% of the experimental group. It is important to emphasize that among the participants of the control group, 11 individuals were users of HA with telecoil, while in the experimental group this number was 8.

With regard to the appropriate placement of the telephone in the HA, the participants who obtained an excellent result were 28.75% of the control group and 66.67% of the experimental group. The participants who obtained a result classified as poor were 35.71% of the control group and 8.33% of the experimental group; a total of 14 participants of the control group performed this task, while only 12 of the experimental group did it.

Regarding the comparison of the percentage of the total score obtained in the evaluation instrument PHAST, in each question evaluated, no statistical significance was found between the difference of the results obtained by the control group and the experimental group. These results were computed through the non-parametric Mann-Whitney test, with a significance level of 0.05.

The results of the performance of the control and experimental group are shown in Table 1.

The experimental group was submitted to a questionnaire that evaluated, under the user´s point of view, the effectiveness of the information provided in the DVD to help the understanding of the content about the use/manipulation and cleaning of the HA. It is noteworthy that most of the DVD users reported that it "helped a lot" concerning the function of the Hearing device, how it works, how to clean the earmold and change the battery (Figure 2).

Regarding the aspect of manipulating, inserting and removing the HA from the ear, volume control and also knowing how to protect it appropriately and identifying and solving the

Table 1. Classification of the performance obtained in the PHAST, by the Control and Experimental groups

		Classification PHAST				Total
		Poor	Satisfactory	Good	Excellent	
Control Group	n	6	5	0	3	14
	%	42.86	35.71	0	21.42	100
Experimental Group	n	4	4	0	5	13
	%	30.77	30.77	0	38.46	100

problems it can present, most of the evaluators considered that the DVD helped a lot (Figure 3).

Regarding the level of satisfaction with the information in the DVD, 76.92% claimed to be very satisfied, 7.69% to be satisfied and 15.38% mentioned to be more or less satisfied.

DISCUSSION

In a context of large territory extensions, like in Brazil, and heterogeneity in the distribution of the health professionals, mostly the audiologists, the Tele-health aims to minimize the

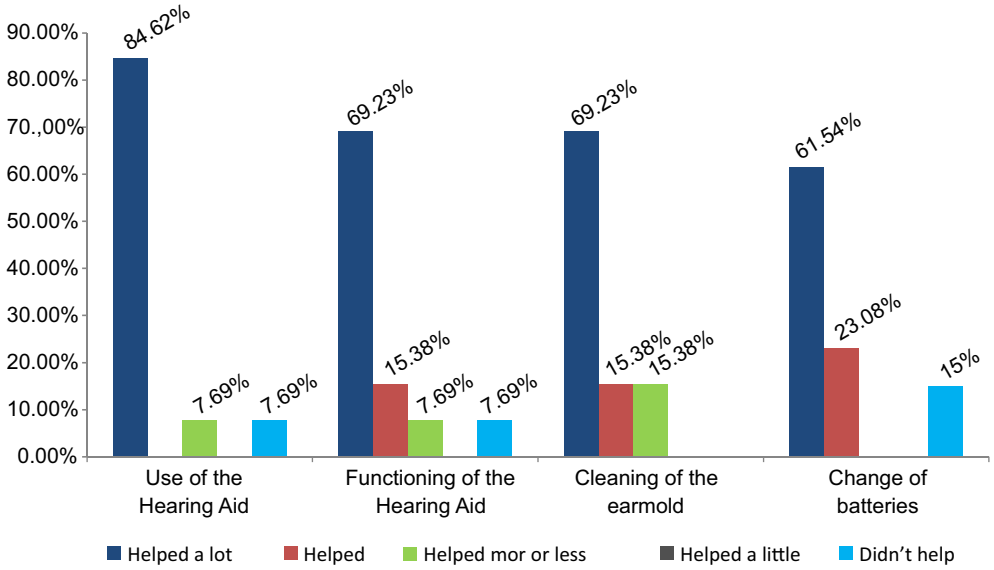

Figure 2. Distribution in percentage of the user self-perception regarding the help of the DVD for the acquisition of knowledge on what it does, functioning of the HA, cleaning of the earmold and battery change.

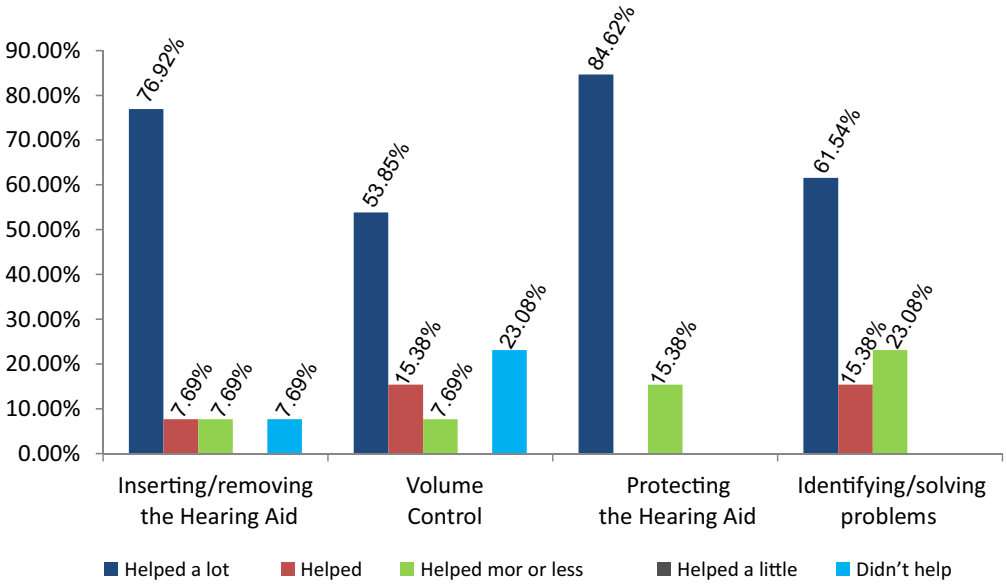

Figure 3. Self-perception of the user regarding the help of the DVD for the acquisition of how to manipulate the HA, protect it, identify and solve its problems

discrepancies of accessibility to service[6]. Tele-health is defined as the use of communication and information technology to provide long-distance health serices[16] and is has the Tele-education as one of its parts.

Tele-education is a learning strategy that has shown to be efficient in many areas, including the health area[6,17]. It is a tool that can potentiate concepts related to health among patients. Through educational materials designed for patients and their families, it is possible for them to have access to the content that had been provided in the speech language pathologist office, whenever necessary, respecting, therefore, each one´s individual learning time.

In the whole process of this study, it was possible to verify the control and experimental groups showed a similar performance in the tasks evaluated by the instrument PHAST. However, it is possible to observe there was a greater easiness in certain tasks for the group that used the DVD.

Regarding the task of removing the HA from the ear specifically, a great difficulty was identified, greater in the control group than in the experimental group. In the task of inserting the HA in the ear, the difficulty kept present in both groups. The rate of such difficulty confirms other findings of literature, that show the difficulty with the insertion and removal of the HA from the ear[3,18,19]. The DVD showed to be efficient in helping with the removal of the HA, but it did not have the same effect for the insertion of this device, possibly because this task demands a greater control and manual dexterity, if compared to the removal.

Regarding the cleaning of the HA and the earmold, difficulties were also found in a greater degree for the control group and in a lower degree for the experimental group. The difficulty found corroborates with the study carried out[11] that, in the use of the instrument PHAST, revealed that only 38% of the 50 individuals evaluated obtained an excellent performance in this task. The result of this research refers to a study carried out that highlights the importance of the appropriate cleaning of the earmold to avoid the appearance of pathogen agents, which can even result in a severe infection in the auditory canal[20].

The manipulation of the volume control was evaluated and only one third of the sample of the experimental group achieved an excellent performance in this task, this index was smaller in the control group. Equivalent percentages in both groups were unable to perform the action. Such difficulty was also found in other studies in literature[21,22]. Authors even mention that the presence of the volume control can be satisfactory to some users, but complicated to others, due to a difficulty in manipulating it, mainly to the elderly[18].

With regard to the use of the telephone, considering the use of the telecoil, little more than a third of the experimental group, only, obtained an excellent performance. As to the telecoil, less than 10% of the participants of the control group were able to achieve an excellent score. More than half of the control group and more than 35% of the experimental group were unable to perform the task. Regarding the right placement of the telephone in relation to the HA, most of the experimental group and less than a third of the control group performed the task with an excellent score. The index of difficulty in this task must alert the professionals who deal with the adaptation of the HA about the importance of a greater dedication in the training. Apparently, the DVD showed to be efficient in helping the users of the experimental group to have a greater domain regarding the use of the telephone, as a whole. These results corroborate with some studies[3,11,22], showing to be important, because the fact of not using the telephone will reflect on the perception the users have in their HA adaptation[23,24].

With regard to the experimental group performance, compared with the control group, in the seven questions tested in the PHAST, no significant difference was found. Such information is reinforced in Table 1, with the classification of the performance obtained in the Questionnaire PHAST. However, it can be considered that the material can be used to supplement the guidance provided in the speech-language pathologist office, stimulating the co-participation of the elderly in the process of adaptation of the HA, dividing this group responsibilities to success with the professional.

In the self-perception questionnaire on the help the DVD provided in specific knowledge about the HA, most evaluators reported the educational material "helped a lot" to understand all knowledge about the HA. That demonstrates the importance of the DVD to help the participants perform the more common daily tasks of the HA, verifying once more the information provided by the speech-language pathologist in the service.

It is important to affirm the content of the DVD "Knowing and Learning about my Hearing Aid" does not comprise a specific approach for identifying and solving problems that can occur with the "HA/earmold". However, more than half reported the DVD helped a lot in this aspect (Figure 2). When questioned about how this help had occurred, some answered: "It was watching the DVD that I found out the beep that happened in the device was to change the batteries, otherwise, I wouldn`t know it" and "I didn´t know the beep of the device was to change the battery, I learned in the DVD". A study[25] referred that the material addressed to adults must have a dynamic concept of intelligence and this occurred with the incentive to reasoning in this DVD.

Regarding the level of satisfaction with the information comprised in the DVD, most participants reported to be very satisfied. Therefore, based on the exposed above, it is possible to affirm the DVD "Knowing and Learning about my Hearing Aid" achieved its objective, analyzing, even some comments of the individuals, for example: "I liked the DVD a lot, I watched it many times and I´ll watch it more times. Seeing how one must do it is different from just saying it!" and "Thank you, because you do researches that help you, help professionals, and, mainly, us, who are patients".

It is noteworthy that, in this study, a process of guidance

was carried out concerning the use and manipulation of the HA/earmold, including a training with the participants, so that they could leave the service already knowing how to manipulate the HA. Besides, the guidance was based in the literature[10], being adapted to the specificities of each individual.

Although, literature mentions that besides the level of information retained by the individuals, in the guidance process, be low compared with the level of information provided[10,12,26], a lot of information is remembered incorrectly[7]. These pieces of information corroborate with the results obtained and discussed before, regarding the users´ performance in the use, manipulation and cleaning of the HA/earmold. Another fact that confirms the results found by the studies mentioned[7,10,12,26] is what two participants reported about not knowing the meaning of the "beep" until watching the DVD and what other two participants reported, pointing the "cotton bud" as the correct way of dealing with the excess of wax in the external auditory canal, also mentioning, that the DVD had such information and emphasized the importance of looking for a otorhinolaryngologist to solve this problem.

Another important aspect is associated with the age of the group studied. Literature mentions the cognitive decline is present in the elderly population[27], with complaints regarding the memory[28] and a slower reasoning[29] that consequently, explains confusing situations caused by lack of memory.

Thus, it is important that the scientific community of universities and research centers develop strategies in order to solve and/or minimize these difficulties found by hearing impaired individuals, including the elderly, considering all factors that are not related to the hearing. The use of Tele-education as a tool can be a facilitator to break physical and demographical barriers, such as the ones existing in Brazil.

The development of the DVD "Knowing and Learning about my Hearing Aid", this study objective, is confirmed, as the material can be made available in many health segments, from Basic Health Units (BHU) to High Complexity Hearing Centers. The highly need of including training for the new users of HA is emphasized, including the elderly, in addition to developing methods and strategies that reach such population with the intention that the learning on the use and cleaning of the HA is internalized by the individual.

CONCLUSION

The material presented in the DVD showed to be effective to help in the learning of the HA user; it can be one more resource used in the adaptation of this kind of device.

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