YOUNG DOCTOR BAURU PROJECT: TRAINING OF HIGH SCHOOL STUDENTS IN HEARING HEALTH

Projeto Jovem Doutor Bauru: capacitação de estudantes do ensino médio em saúde auditiva

Wanderléia Quinhoeiro Blasca [1], Mirela Machado Picolini [2], Andressa Sharllene da Carneiro da Silva [3], Karis de Campos [4], Ghiedree Fernanda Ramos Pinto [5], Alcione Ghedini Brasolotto [6], Katia de Freitas Alvarenga [7], Luciana Paula Maximino [8], Giédre Berretin-Felix [9]

ABSTRACT

Purpose: to develop a training program for high school students on hearing health. **Method:** 14 high school students from two public schools participated in the training program. The program was divided into three stages: classroom activities, online tutoring and practical activity. During the 1st stage, participants attended a lecture given by tutors. During the 2nd stage the participants had access to a web-based electronic tutor, the '*Cybertutor'*. During the 3rd stage practical activities were prepared, providing construction and multiplication of learning for the students. To evaluate the educational online material participants answered an evaluation questionnaire about '*Cybertutor'* at the end of the training program. **Results:** 100% of the participants performed the three stages of the training program. Following the proposal of the Young Doctor Project, the students were entitled "Young Doctors" and multiplied the knowledge gained about hearing health, through a fair exhibition in their respective schools. Data from the evaluation questionnaire on the '*Cybertutor'* indicate that most participants showed a positive opinion, showing a high level of approval for the '*Cybertutor'*. **Conclusion:** this training program on hearing health promotes learning in this theme on the proposed population. Health education initiatives, such as the Young Doctor Project, besides providing the multiplication of knowledge, also made possible the integration of the students with the University and the University with the community, forming a network of collaborative learning.

KEYWORDS: Distance Education; Training; Speech, Language and Hearing Sciences; Audiology

INTRODUCTION

The hearing disorders are considered a public health problem all over the world. Particularly in Brazil, according to census realized by the Brazilian Institute of Geography and Statistics[1], it is estimated that 24.5 million of people, or 14.5% of the total

(1) Department of Speech-Language Pathology and Hearing of the Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

(2) Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

(3) Hospital for Rehabilitation of Craniofacial Anomalies, University of São Paulo, HRAC-USP, Bauru-SP, Brazil.

(4) Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

(5) Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

(6) Department of Speech-Language Pathology and Hearing of the Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

(7) Department of Speech-Language Pathology and Hearing of the Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

(8) Department of Speech-Language Pathology and Hearing of the Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

(9) Department of Speech-Language Pathology and Hearing of the Bauru School of Dentistry, University of São Paulo, FOB-USP, Bauru-SP, Brazil.

Conflict of interest: non-existent

population, present some kind of impairment or handicap. Of those, 5.7 million or 16.7% have hearing loss, which it is classified as the third major deficiency in the country, followed by the impairments motor (22.9%) and visual (48.1%).

Specific studies realized in the last years positioned the hearing loss as, among all human disorders, one of the most devastating, regarding the individual communication to the society, since it interferes directly in the development of language, speech, interpersonal communication and learning, may impair the scholar develop and, therefore, the professional[2-4].

Aiming to develop and stimulate actions that promote the practice of attention in hearing health, the Ministry of Health has proposed projects of promotion, prevention and early identification of hearing problems in the community, and also informative and educational proposals directed to primary attention. In this manner, the creation of educational programs add to technologies of information and communication (TICs) may embrace a higher number of people, population awareness concerning the essential health care by dissipating the gained knowledge and, consequently, diminishing costs of treatment in the health systems[5].

The "Young Doctor Project" is a recent innovating initiative of education in health, which successfully regards these factors and provides to students of elementary, secondary and higher education, actions of citizenship to the community[6-7].

The project has as its remarkable feature, the opportunity for students to do scientific initiation, the citizenship exercise, digital inclusion and learning about themes relative to health. In this context, it proposes the theoretical knowledge applied in practice under teachers' orientation from an academic extension course. Moreover, the "Young Doctor Project" provides to students a different knowledge and, mainly, a higher comprehension about the features of primary health care by means of a joint action of the university with the community.

Based on it, the "Young Doctor Project Bauru" rises as an important strategy of disease prevention and promotion of health, associating education and technology, from the use of Telemedicine resources, distance education and of the Virtual Man Project. Such peculiar features found the formation of a collaborative learning network as a way of education and promotion of health providing significantly the change in the behavior regarding the aspects related to health[6-8] and, essentially, establishing a complex process that is named "Supply Chain Health".

Therefore, the proposal of this study was to create a qualification program for secondary education students concerning the hearing health theme, stimulating the aspects of hearing health promotion in primary attention.

METHOD

This study was develop in an association between the Department of Speech-Language Pathology and Hearing Science of the Bauru School of Dentistry (FOB-USP) and the Telemedicine Discipline of the Department of Pathology, School of Medicine, University of São Paulo (DTM/FMUSP), as part of the project contemplated by the Millennium Institute Edict – CNPq – "Medical Digital Station: implementation and extension strategy of Telemedicine in Brazil, since 2005".

Sample:

Participated on this study 14 students in the secondary education of two public schools, divided in four students of the second year of the secondary education in the state school *"Irmã Arminda Sbríssia"*, in the city of Bauru; and 10 students of the third year of the secondary education of the state school *"Prof. Sebastião Inoc de Assumpção"*, in the city of Arealva. The students were selected through the availability and interest in participate on the program. The volunteer participation was initiated after the signature of the Consent Form.

The team (tutors) of the project Young Doctor Bauru was composed by undergraduation students, post-graduation, and professors of the FOB-USP and professionals of the Hospital for Rehabilitation of Craniofacial Anomalies (HRAC-USP) and a coordinator professor.

Procedures:

Qualification Program

Aiming to direct the students' learning, by the Interactive Teleducation, the program was divided in three stages: classroom activities, online tutoring and training.

1st Stage – Classroom Activity

In the first stage of the qualification program was realized a presence lecture during four hours, using audiovisual resources and 3D iconographic animations of the CD-ROM Virtual Man of Hearing[9], in which was approached aspects regarding hearing health: prevention, diagnosis and rehabilitation, conducted by undergraduation students assisted by post-graduation students at FOB-USP and supervision of the coordinator professor.

2nd Stage – Online Tutoring

Initially the team of the Young Doctor Project Bauru developed the online educational material

– electronic tutor (Cybertutor) used in this stage on the subject Hearing Health: prevention, diagnosis and rehabilitation.

To create this material, the present study had the authors' experience in addition to the bibliographic research. This research was realized by consulting the literature review on the data bases (LILACs, Pubmed, Medline and Websciense) considering the classic and recent publications of the last five years, and also dissertations and thesis.

Were produced and also inserted into the educational material, images and illustrative videos related to the subject, aiming to stimulate and facilitate the learning. The team of the project produced and edited the videos available on Cybertutor.

The Cybertutor on the subject Hearing Health was composed by the following topics: how we hear, development of the hearing function, sound nature, abilities of hearing, hearing loss, diagnosis, treatment, rehabilitation, inappropriate usage of electronic devices and prevention aspects.

In the second stage, the participants had to study and complement the ministered contents, using an online electronic tutor (Cybertutor) by accessing the site of the "Young Doctor Project" (www.projetojovemdoutor.org.br). In this process, all the students were registered in the system and received a password and login to access the electronic content.

The Cybertutor is a tool created by the Telemedicine Discipline of the School of Medicine of USP, which enables to monitoring, by internet, the student's learning in an interactivity manner. It enables the course coordinator to verify the time and performance in the study of each student, and also to have access to doubts by means of a discussion list. Figure 1 shows the Cybertutor access screen.

Figure 1 – Access Screen to Cybertutor (partial illustration)

3rd Stage – Training

In the third stage, students participated on practice activities that complemented the gained learning.

The students participated on the workshop, which theme was *"Hearing, hearing skills and my routine"*, so they were able to be more actives in the construction of knowledge.

Other practice activity performed by participants was the multiplication of knowledge. In this activity the participants were titled "Young Doctors" and had to transmit the gained knowledge to the rest of the academic community, relatives, and the community that the school are insert on. This action of knowledge multiplication is part of the methodological proposal of the Young Doctor Project.

Results analyses:

The results were separated in two parts, qualification program and assessment questionnaire.

Qualification Program

The results were organized following the chronological order of the stages in the qualification program. All data were demonstrated in descriptive manner.

Assessment Questionnaire

To assess the Cybertutor, as online educational material, the participants answered to an assessment questionnaire at the end of the qualification program.

This questionnaire, had 10 questions about: image quality, videos and animations, difficulty in the navigation process on Cybertutor, organization of the online material, easiness in understanding, aspects related to the content and vocabulary.

This study was submitted and approved by the Committee of Ethics in Research with Humans of the Bauru School of Dentistry under statement nº 136/2009.

The statistical analysis of the questionnaire application about Cybertutor was realized by the percentage descriptive analysis.

RESULTS

Qualification Program:

1st Stage – Classroom Activity

The classroom activity was realized by a lecture at FOB-USP, in September, 2009 (Figure 2).

Figure 2 – Lecture about hearing health

The lecture was elaborated and conducted by undergraduation and post-graduation students and professionals of HRAC-USP under orientation and monitoring of professors of the Department of Speech-Language and Hearing Science at FOB-USP, and also the professor coordinator of the project. The lecture had duration of four hours and presented the hearing health subject: prevention, diagnosis and rehabilitation. Also, was discussed topics related to the physiology of hearing, hearing loss and treatments.

The lecture was presented in power-point (office 2007), containing the whole theoretical subject of the qualification program. In the presentation were used the following technologic subjects: streaming videos and 3D iconographic of the Virtual Man Project on Hearing (Figures 3 and 4).

Figure 3 – Representative images of the CD-ROM "Virtual Man of Hearing"

Figure 4 – Representative images of the CD-ROM "Virtual Man of Hearing"

2nd Stage – Online Tutoring

The team of the TMD-FMUSP was responsible for providing on internet the Cybertutor developed by the Young Doctor Project Bauru.

The participants had a 30 days deadline to access the Cybertutor. The access was realized through individual login and password, thus, facilitating the access as many times were necessary, the privileges in studies schedules and place alternatives.

To guarantee the access and follow the learning of the participants in this stage, they were monitored by the team (tutors).

The Cybertutor enables to fragment the theoretical content in modules, using a discussion list (forum and chat) on internet to ensure the interactivity between participants and tutors using the online tutoring system (Figures 5,6 and 7).

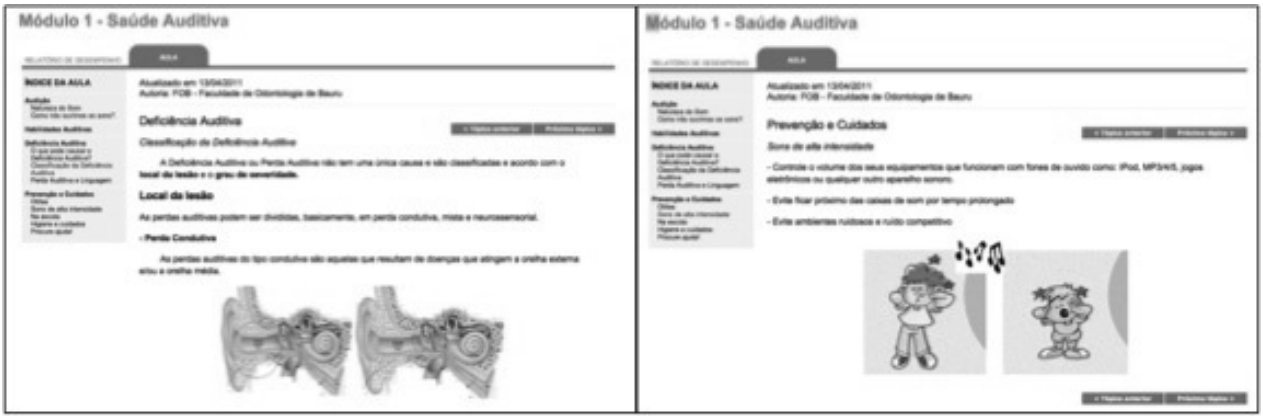

Figure 5 – Representative Page of the theoretical content – "Auditory Health" (partial illustration)

Figure 6 – Representative Page of the theoretical content – "Treatment / Rehabilitation" (partial illustration)

Figure 7 – Representative Page of the Cybertutor – Discussion List (partial illustration)

3rd Stage – Training

The workshop titled *"Hearing, hearing skills and my routine"* was realized at the FOB-USP, with mean duration of 1 hour.

All participants, i.e., 100% of the sample participated on workshop. In this training the individuals interacted with tutors and group, enabling to clarify any possible doubt.

Specific topics were discussed on hearing skills, relevance and application in routine. Tutors developed activities of integration and participation of all students.

In a second moment, focusing in multiplication of the gained knowledge the participants performed an exhibition in their respective schools. The exhibition had the involvement and support of the Young Doctor Project Bauru team.

All individuals acted as multipliers of knowledge, transmitting information to other school students, teachers, employees and community, a total of approximately 300 people. Figure 8 shows the exposure.

Figure 8 – Young Doctor Project – Multiplication of knowledge in school

Assessment Questionnaire:

Table 1 presents data of the Cybertutor assessment questionnaire. Data are described in percentage, according to the evaluation criteria (excellent, satisfactory, acceptable and unsatisfactory). Most of the students presented positive opinion, showing a high level of Cybertutor approval.

Table 1 – Questionnaire used in the assessment of the Cybertutor

Statement	Answer			
	Unsatisfactory (%)	Acceptable (%)	Satisfactory (%)	Excellent (%)
1 - Images quality	-	-	50.0%	50.0%
2 - Videos quality	7.1%	21.4%	35.7%	35.7%
3 - Animation quality	-	-	50.0%	50.0%
4 - Navigation facility	-	21.4%	35.7%	42.9%
5 - Material Disposition	-	-	42.9%	57.1%
6 - Content Disposition	-	7.1%	21.4%	71.5%
7 - Content Update	-	7.1%	50%	42.9%
8 - Content Organization	-	-	35.7%	64.3%
9 - Vocabulary used	-	7.1%	35.7%	57.1%
10 - Presence of images and videos that clarifies de content	-	21.4%	57.1%	21.4%

DISCUSSION

To elaborate the qualification program were established different stages, such as classroom activities, online tutoring and training, all of it involving the co-work of students and professors in developing the educational materials, but mainly, in the framework of a factual proposal to participation of the community. The effectiveness of an education program depends, among several factors, on modern education materials, qualification professors and student involvement in actions directed to community[6].

In the first stage of the qualification program, the students participated on a lecture, based on aspects directed to prevention, diagnosis and rehabilitation in a hearing health area. During the lecture it was possible to observe that the theme stimulated the curiosity and interest of students, regarding the expressive quantity of questions faced to their spontaneous participation.

Related to the technological resources used in this stage (Figures 3 and 4), different studies[8,10-12], also used the 3D iconography of the Virtual Man Project to acquisition of new knowledge. The Virtual Man is a powerful iconographic resource which assists learning, since it promotes the understanding related to a specific subject[13].

The second stage of the qualification program was developed by online tutoring. The Cybertutor used in this stage (Figures 5, 6 and 7) promoted the students learning, because it enables fragmented the subject in modules, making more ease the visualization and acquisition of knowledge. Because it is an electronic tutor available on internet, the access hours were more flexible, and also it was possible to access as many times as were necessary. For some authors[14-15], the Cybertutor combines traditional methods of education with innovation opportunities, complementing learning and enabling the constant update of information. In Brazil, recent studies [8,10,12,16,17] has shown the effectiveness of Cybertutor as learning object to the acquisition of knowledge in different subjects.

The third stage of the qualification program involved a training that promoted the contact of students, not only with the subject, but also with tutors of the program. The elaboration of the training allows higher applicability and acquisition of knowledge[18]. The dynamic of the workshop became a differential, since it symbolized an exchange of experience, and also a dynamic and interactive learning.

As a proposal of the Young Doctor Project, the students titled “Young Doctors” became multipliers of knowledge agents to the local community (Figure 8). This initiative of education in health has proving itself as an effective measure to disseminate information to improve life quality of population in the most different regions of the country[19-20].

Thus, the presentation of the stages features the insertion of the program based on TICs, in which the Interactive Teleducation provides a better participation, emphasized by the interest and motivation of students to build knowledge.

Analyzing data from Table 1 regarding the Cybertutor assessment as an online educational material used as a qualification program, it was observed that 50% or more of the students considered the Cybertutor as “excellent” when questioned about the quality of images, animations, material disposition, comprehension and organization of the

content, and the vocabulary used. 50% or more of students considered the Cybertutor "satisfactory" when questioned about the presence of images and videos that clarify the content and update of the content. In relation to the facility of navigation and quality of videos 42.9% and 35.7% of students considered the Cybertutor "excellent".

It is emphasized that 71.5% of participants evaluated the comprehension of the content as "excellent". This data shows that the Cybertutor is an object of learning which promotes the acquisition of knowledge, becoming a valuable tool in the teaching-learning. Regarding the presence of images and videos that clarify the content, 21.4% of participants evaluated as "excellent". This data can be justified by the difficulty of access to videos available on tutor. The quality of videos and the speed of navigation can influence directly in the access of the material.

Thereby, it was possible to verify that, generally, the students' opinion was positive, showing a high rate of approval, however, it is impossible to not consider the answers "acceptable" and "unsatisfactory". The opinion of the students is essential to reformulating and adaptation of the educational material, always aiming a better acceptation and learning.

Different studies[12, 16] which also assess the Cybertutor as a learning object, proved the high satisfaction, acceptation and effectiveness of learning, besides stimulates the interactivity with lists and discussion forums.

In sum, the integration of participants and tutors, added to descriptive results collected by the questionnaire, and, mainly, the personal testimonials of the participants, proved that the Young Doctor Project Bauru has great importance to the individual growth, giving them responsibility and raising interest in the aspects related to population's health, creating a social concern, which resulted in knowledge multiplication. Attention should also be given to the approximation of students with the University that provides a higher motivation and expectation about their possible academic careers.

CONCLUSION

Based on the exposed, it is proved that the developed qualification program, promotes the acquisition of knowledge in hearing health to the proposed population. The students of secondary school, who participated of the Young Doctor Project Bauru, shared the knowledge gained with other colleagues on the same school, as also with their relatives and community, establishing a collaborative learning network that can be applied in favor of primary attentions to hearing health.

ACKNOWLEDGMENTS

To the Telemedicine Discipline of the Medicine School of the University of São Paulo (DTM/FMUSP), specially the Professor Dr. Chao Lung Wen by the partnership and realization of this study.

RESUMO

Objetivo: elaborar um programa de capacitação para alunos do ensino médio sobre o tema saúde auditiva. **Método:** 14 estudantes do ensino médio de duas escolas da rede pública participaram do programa de capacitação. O programa foi dividido em 3 etapas: atividade presencial, tutoração *on line* e atividade prática. Na 1ª etapa, os participantes frequentaram uma aula expositiva ministrada pelos tutores. Na 2ª etapa os participantes tiveram acesso a um tutor eletrônico baseado na Internet, o *Cybertutor.* Na 3ª etapa foram elaboradas atividades práticas, proporcionando aos alunos a construção e multiplicação do aprendizado. Para avaliar o material educacional *on line* os participantes responderam um questionário de avaliação sobre o *Cybertutor* no término do programa de capacitação. **Resultados:** 100% dos participantes realizaram as 3 etapas do programa de capacitação. Seguindo a proposta do Projeto Jovem Doutor, os alunos foram intitulados "Jovens Doutores" e multiplicaram o conhecimento adquirido sobre saúde auditiva, através de uma feira expositiva, em suas respectivas escolas. Os dados do questionário de avaliação sobre o *Cybertutor* indicam que a maioria dos participantes apresentou opinião positiva, demostrando um alto índice aprovação do *Cybertutor*. **Conclusão:** este programa de capacitação em saúde auditiva favoreceu o aprendizado nesta temática para a população proposta. Iniciativas de educação em saúde, como o Projeto Jovem Doutor, além de proporcionar a multiplicação do conhecimento, possibilitou também a integração dos alunos participantes com a Universidade e da Universidade para com a comunidade, constituindo uma rede de aprendizagem colaborativa.

DESCRITORES: Educação a Distância; Capacitação; Fonoaudiologia; Audiologia

REFERENCES

1. Instituto Brasileiro de Geografia e Estatística – IBGE [homepage na internet]. Censo Demográfico 2000. [acesso em 18 de fevereiro de 2009] Disponível em: http://www.ibge.gov.br/home/estatistica/populacao/censo2000/populacao/deficiencia_Censo2000.pdf

2. Cruz MS, Oliveira LR, Carandina L, Lima MCP, César CLG, Barros MBA et al. Prevalência de deficiência auditiva referida e causas atribuídas: um estudo de base populacional. Cad Saúde Pública. 2009; 25(5):1123-31.

3. Agrawal Y, Platz EA, Niparko JK. Prevalence of hearing loss and differences by demographic characteristics among US Adults. Arch Intern Med. 2008; 168(14):1522-30.

4. Arlinger S. Negative consequences of uncorrected hearing loss-a review. Int J Audiol. 2003; 42(2):S17-20.

5. Campos FE, Haddad AE, Chao LW, Alkmin MBM. Telessaúde em apoio à atenção primária à saúde no Brasil. In: Santos AF, Souza C, Alves HJ, Santos SF. Telessaúde – um instrumento de suporte assistencial e educação permanente. 1 ed. Belo Horizonte: Editora UFMG; 2006. p. 59-74.

6. Wen CL. Cadeia produtiva de saúde: uma concepção mais ampla da telemedicina e e telessaúde. Rev Telem Telessaude. 2006;2(2):8-10. [acesso em 24 de maio de 2010]. Disponível em: http://www.estacaodigitalmedica.com.br/edm/institucional/publicacoes/jornal_dez2006.pdf

7. Blasca WQ, Ferrari DV, Picolini MM, Campos K, Silva ASC, Alvarenga KF et al. Teleducation for auditory health promotion among teenagers. In: Proceedings of the Audiology NOW – American Academy of Audiology; San Diego, CA. SanDiego; 2010. p. 172-3.

8. Sequeira E. Aplicação de modelo educacional interativo como recurso para orientação e motivação sobre saúde oral em idosos [tese]. São Paulo (SP): Faculdade de Medicina da Universidade de São Paulo; 2009.

9. Böhm GM, Cruz OLM, Zanoni A, Zorzetto NL, Oliveira JAC, Sady S et al. Homem Virtual: Audição [2CD-ROM]. Telemedicina:Faculdade de Medicina da Universidade de São Paulo; 2005.

10. Kavamoto CA, Wen CL, Battistella LR, Böhm GM. A Brazilian model of distance education in physical medicine and rehabilitation based on videoconferencing and Internet learning. J Telemed Telecare. 2005; 11(S1):S80-S2.

11. Paixão MP, Miot HA, Filho LO, Wen CL. Dermatúnel: modelo de ambiente interativo de aprendizagem em dermatologia. Saúde Soc. 2009; 18(4):800-8.

12. Paixão MP, Miot HA, Souza PE, Haddad AE, Wen CL. A university extension course in leprosy: telemedicine in the Amazon for primary healthcare. J Telemed Telecare. 2009; 15(2):64-7.

13. Wen CL. Telemedicina e Telessaúde- Um panorama no Brasil. Informática Pública. 2008; 10(2):7-15.
14. Soirefmann M, Boza JC, Comparin C, Cestari TF, Wen CL. Cybertutor: um objeto de ensino na Dermatologia. An Bras Dermatol [periódico na Internet]. 2010; 85(3):400-2.
15. Ferrari DV, Blasca WQ, Bevilacqua MC, Wen CL. Audiology Telehealth Research in Brazil. Audinews. 2008; 8(57):4-5.
16. Blasca WQ, Maximino LP, Galdino DG, Campos K, Picolini MM. Novas tecnologias educacionais no ensino da Audiologia. Rev CEFAC. 2010; 12(6)1017-24.
17. Eskenazi ES, Martins MA, Ferreira MJr. Oral health promotion through an online training program for medical students. J Dent Educ. 2011; 75(5):672-8.
18. Blasca WQ, Picolini MM, Campos K, Silva ASC, Souza PJS, Martins A et al. Workshop auditory skills: an innovative proposal the applicability of projects teleducation. In: 30th International Congress Audiology and 25º Encontro Internacional de Audiologia; São Paulo SP. São Paulo, 2010 p. 119.
19. Macéa DD, Rondon S, Chaar LJ, Wen CL. Public health education for young students aided by technology. J Telemed Telecare. 2009; 15:159.
20. Toassa EC, Leal GVS, Wen CL, Philippi ST. Atividades lúdicas na orientação nutricional de adolescents do Projeto Jovem Doutor. Rev Soc Bras Alim Nutr. 2010; 35(3):17-27.

Received on: October 21;2011
Accepeted on: April 25, 2012

Mailing address:
Wanderléia Quinhoneiro Blasca
Departamento de Fonoaudiologia da Faculdade de Odontologia de Bauru da Universidade de São Paulo (FOB/USP)
Rua: Al. Dr. Octávio Pinheiro Brisolla, 9-75 – Vila Universitária
Bauru – SP – Brasil
CEP: 17012-901
E-mail: wblasca@fob.usp.br