

# COMMUNITY HEALTH WORKERS TRAINING ON INFANT HEARING HEALTH: INFORMATION RETENTION

## *Capacitação de agentes comunitários de saúde na área de saúde auditiva infantil: retenção da informação recebida*

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### ABSTRACT

**Purpose:** to investigate the information retention provided to Community Health Workers on infant hearing health training. **Methods:** the sample was composed of 24 Community Health Workers prior trained through a cybertutor, a based web education system. The content was ranging from prevention to rehabilitation of hearing impairment. Immediately after training, the Community Health Workers answered a multiple choice questionnaire with 20 questions, divided into domains (1: general concepts; 2: type, prevention and causes of hearing impairment; 3: Techniques of identification and diagnosis of the hearing impairment; 4: general aspects of hearing impairment). The same questionnaire was applied one more time after 15 months. The information retention level was analyzed comparing performance in the evaluations by the Wilcoxon test and the significance level adopted was 5%. **Results:** it was verified a significant decrease ( $p = 0.03$ ) in percentage, of the Community Health Workers general knowledge on infant hearing health ( $73,5 \pm 8,4 / 66,7 \pm 12,5$ ). In the analysis by domains it was possible to see a worsening in 1 ( $76,4 \pm 14,7 / 58,3 \pm 22,5$ ), 2 ( $72,9 \pm 30,3 / 64,6 \pm 19,4$ ) and 3 ( $69,4 \pm 14,5 / 68,8 \pm 17,2$ ) domains, it was significant in 1 domain ( $p = 0.012$ ). Regarding to 4 domain, there was a slight improvement ( $76,0 \pm 11,6 / 78,1 \pm 11,2$ ). **Conclusion:** it was observed significant decrease of the Community Health Workers knowledge on infant hearing health, which demonstrates that the community health workers training should occur continuously.

**KEYWORDS:** Training; Family Health Program; Retention (Psychology); Hearing; Audiology

### ■ INTRODUCTION

Aiming at promoting the training and skill development of professionals in the Family Health Strategy (FHS), since 2004, the Ministry of Health established the National Policy of Permanent Education in Health (NPPEH)<sup>1</sup>. Among the recommendations for the effective implementation of this policy is the

importance of promoting linkages between educational institutions and other strategic programs of the Labor Management and Health Education Secretariat, such as the "Pró-Saúde", "PET-Saúde", "UnA-SUS", "Profaps" and "Telesaúde".

It is noteworthy that several definitions have been attributed to the permanent health education (PHE), some of which correspond to in-service education, continuing education and formal education of professionals. Nevertheless, the conceptual debate has advanced considerably with the proposal<sup>2</sup> of quadrilateral training in health – education / healthcare management / care practices / social control, to place this training as an educational project that goes beyond education, to the technical-scientific domain of the profession and proposes the construction and organization of an education responsible for

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Conflict of interest: non-existent

interactive processes of action in reality to make changes (a desire for the future), mobilizing paths (negotiating and agreeing with processes), calling protagonisms (pedagogy *in acto*) and detecting the interactive and mobile scenarios of individuals, groups and institutions, such as knowledge and inventions (continuous mapping).

PHE also increased the debate on adult education and training opportunities that presupposes the use of teaching and learning active methods, the innovative pedagogical model being that of learning by doing, which assumes the inversion of the classical sequence theory/practice in knowledge production and assumes that it occurs dynamically, through action/reflection/action<sup>3</sup>. Tutoring must be present, both in classroom or distance activities, providing agility in the communication between professionals and tutors / facilitators / supervisors, so as to monitor the work and coping with critical situations<sup>3</sup>.

More recently, the Care Network for People with Disabilities within the Public Health System was established through decree No. 793 of 24 April 2012<sup>4</sup>. Primary care is one of the components in which this network will be organized and human resources training, both in the basic network, including family health teams and community health workers, and in physical, hearing, visual and intellectual rehabilitation services, remains as one of the guidelines of the National Health Policy for disabled people<sup>4</sup>.

In the specific literature, it is verified that health education actions for FHS professionals are generally directed to Community Health Workers (CHW) and nurses, occurring predominantly by means of introductory courses and within programs such as those of AIDS, Tuberculosis, Hemodialysis, Dengue, among others<sup>5-7</sup>.

As for speech therapy, some studies have been conducted in order to develop tools or provide training programs for CHWs<sup>8,9</sup>. In relation to hearing health, specifically, at the national level, since 2005, the researchers of this study at the Department of Speech Pathology of the institution have developed studies aimed at training the CHWs along with the Department of Health of Bauru, SP, Sorocaba, SP and Itajaí, SC.

Hearing impairment is considered a public health problem owing to its prevalence as well as its impact on the development of the individual, involving language and social, emotional, academic and professional aspects. According to the World Health Organization (WHO), the estimated number of people presented with disabling hearing loss was 278 millions, in 2005<sup>10</sup>.

At the national level, the census showed that 5.1% of the Brazilian population declared disability, with some or great hearing difficulty<sup>11</sup>. In relation to Bauru, specifically, a prevalence of 0.96: 1,000 sensorineural hearing loss was observed in the analysis of the results of the Newborn Hearing Screening Program developed at a local Public Maternity Hospital, which assists children at high risk and is a reference for the city<sup>12</sup>.

The previously developed studies on hearing health were based on the WHO's requirements, using the material proposed at the International Workshop on Primary Ear and Hearing Care<sup>13</sup>. Initially, this material was adapted to the Brazilian reality and validated, and later, used in a classroom-training program<sup>14</sup>. In subsequent studies, the effectiveness of different interactive tele-education tools such as videoconference<sup>15</sup>, Cybertutor<sup>16</sup> and CD-ROM<sup>17</sup> was analyzed in subsequent studies. In the analysis of the results, the methodology used in these studies was the comparison of the participants' performance through a questionnaire administered in the pre and immediate post-training moments, which showed retention of information in the short term, with a significant difference in general knowledge in both assessment moments.

However, it is essential that professionals manage to apply the knowledge in their daily performance activities not only at the immediate post-training time, but continuously. Thus, the maintenance of the information retention level over time is questioned.

Hence, the present study aimed at verifying the retention of information on infant hearing health by CHWs who participated in a training course.

## METHODS

This is a longitudinal study, approved by the Human Research Ethics Committee of the School of Dentistry - University of São Paulo (FOB-USP) at Bauru, SP, process No. 038/2010, with the free and clarified consent term signed by the participants.

Twenty-four CHWs with representativeness of different FHS teams in Bauru and who had participated in a training program in the area of infant hearing health, joined the study.

Table 1 shows the absolute number of CHWs and FHS teams, as well as the relative amount of population coverage of both, at the federal, state and municipal levels, with reference to the period in which the study was conducted.

(Insert table 1)

**-Training in infant hearing health:**

The training program was conducted through a Cybertutor, an interactive tele-education tool based on the web. This training was conducted in a previous study<sup>16</sup> and its syllabus involved the prevention and

rehabilitation of hearing impairment, organized into five modules: (1) Sound and audio system; (2) Hearing, language and hearing impairment; (3) Causes of hearing impairment and health care; (4) identification and diagnosis of hearing loss in the first year of life; (5) (Re)habilitation of hearing loss,

**Tabela 1 - Absolute number of community health workers and family health strategy teams and the relative amount of population coverage of both, at the federal, state and municipal levels.**

Overview of the amount of CHW and FHS - Reference - August / 2011					
	Population (n)	Community health worker		Family health team	
		Implanted (n)	Population covered (%)	Implanted (n)	Population covered (%)
Brazil	190.755.799	248.521	63.7	32.079	53.11
São Paulo state	41.262.199	25.553	34.74	3.497	28.54
Bauru township	343.937	46	7.69	6	6.02

Source: Primary Care Department. Available: [http://dab.saude.gov.br/historico\\_cobertura\\_sf.php](http://dab.saude.gov.br/historico_cobertura_sf.php). Access: November 1, 2013.

including the use of static, dynamic images and illustrative videos.

The CHWs accessed the material individually and directed their own learning, but guided by the electronic tutor, which verified their performance and study schedule. The tutor allowed moving to the next study module only after the completion of the preceding one, including the correctness of reinforcement exercises at the end of each module. Importantly, all CHWs took the course at the same period and workload.

Immediately after completing the studies of all the modules, the CHWs completed a questionnaire containing 20 multiple choice questions related to the content covered in the training (Figure 1). The questionnaire used was previously translated and adapted to the Brazilian reality<sup>11</sup> and the questions which comprise it were divided into four domains:

- Domain 1: questions 1-6, refer to general concepts on hearing and hearing impairment (Conceptualization);
- Domain 2: questions 7-10, regarding the type, causes and prevention of hearing impairment (Prevention);
- Domain 3: questions 11-16, refer to the techniques of detection and identification of hearing disability (ID), and
- Domain 4: questions 17-20, concerning general aspects of hearing impairment. General knowledge: represented by all the questions (1-20), thus, encompassing the four domains assessed by the questionnaire.

The possible answers were “true”, “false” and “do not know” and the score was computed from the form proposed in previous<sup>14,15</sup>. A point was scored at every correct answer, thus, the total score of the questionnaire is at most 20 points, totaling 100% correct.

Questions	True	False	Do not know
1. Hearing impairment always means that the person is deaf.			
2. Deafness can not be inherited.			
3. A child born deaf can not develop oral language, normally.			
4. Sensorineural hearing loss is when the change is in the cochlea, in the auditory nerve, or in both, simultaneously.			
5. The ear mold engages the hearing aid to the child's ear canal.			
6. Every hearing impaired child will have a hard time hearing what people say.			
7. Non-treated ear infections may cause hearing impairment.			
8. Cochlear cells injuries by exposure to loud noise is always reversible.			
9. Some drugs used for a given period of time can lead to hearing impairment.			
10. Vaccination against Measles, Mumps and Rubella can prevent hearing impairment.			
11. Hearing assessment and hearing screening are the same thing.			
12. The hearing impaired child can receive the hearing aid through the Public Health System.			
13. Some questions can be used to investigate the hearing of babies.			
14. Children under 1 year of age, usually repeat words when asked.			
15. The cochlea is the main sensorial organ of hearing.			
16. The human ear is capable of hearing low, medium and high frequencies.			
17. Cochlear implant is a surgical treatment, however, it does not cure deafness.			
18. Deaf children can not attend school.			
19. Hearing aids amplify the sound for children to hear.			
20. Health workers could guide caregivers in day-care centers to observe the hearing of young children.			

**Figure 1 - Questionnaire administered in the two assessment times.**

#### **- Information retention analysis:**

In order to verify the retention level of the information obtained in the training program, after a 15-month period, once again the CHWs completed a questionnaire that had been applied immediately after the training (Figure 1). The application took place on a single date for all participants, in a meeting held specifically for this purpose.

By comparing the answers of the post-training questionnaire, after a 15-month period, it was possible to analyze the information retention level of the participants.

The data were submitted to descriptive and inferential statistical analysis, using the Wilcoxon test and adopting a significance level of 5%.

#### **■ RESULTS**

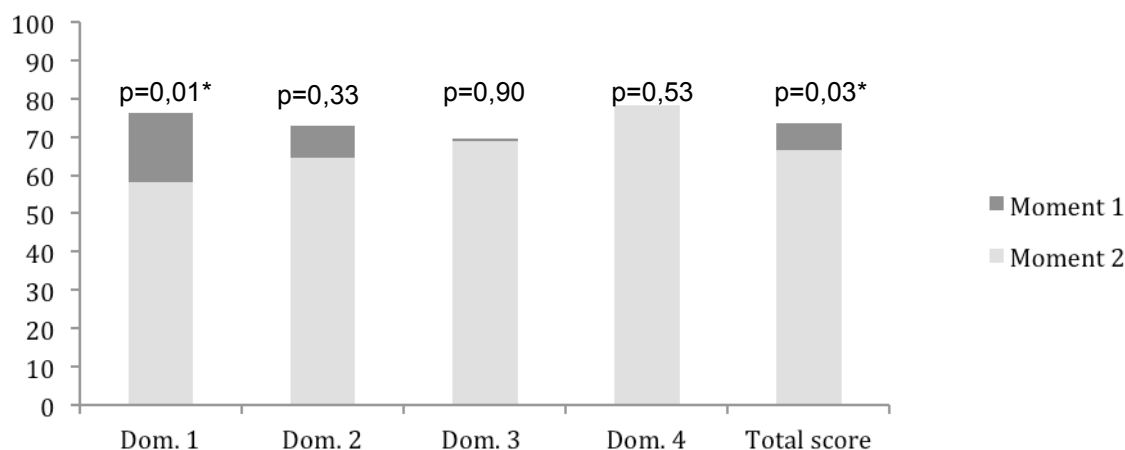
The scores obtained by domains and the total score of the questionnaire applied right after training and 15 months after training (Table 2) were analyzed through descriptive statistics.

**Table 2 - Measurements, in percentage, of the global and domain scores of the questionnaire applied to community health workers right after training (Moment 1) and 15 months after training (Moment 2).**

Domain	Moment	Mean (%)	SD (%)	Median (%)	Minimum (%)	Maximum (%)
1. Concepts	Moment 1	76.4	14.7	66.7	50.0	100.0
	Moment 2	58.3	22.5	66.7	16.7	100.0
2. Prevention	Moment 1	72.9	30.3	75.0	0.0	100.0
	Moment 2	64.6	19.4	75.0	25.0	100.0
3. Identification	Moment 1	69.4	14.5	66.7	50.0	100.0
	Moment 2	68.8	17.2	66.7	33.3	100.0
4. General aspects	Moment 1	76.0	11.6	75.0	50.0	100.0
	Moment 2	78.1	11.2	75.0	50.0	100.0
General knowledge	Moment 1	73.5	8.4	72.5	60.0	90.0
	Moment 2	66.7	12.5	65.0	40.0	90.0

The results of the comparative inferential analysis of the performance across domains and the total score in the two assessment times are shown

in Figure 2 and indicate a significant reduction in the general knowledge of the CHW on infant hearing health ( $p = 0.03$ ).



\* $p \leq 0.05$ : significant difference.

**Figure 2 - Comparison of average performance, in percentage, in the two assessment times: right after training (Moment 1) and 15 months after training (Moment 2).**

## ■ DISCUSSION

Information retention analyzed in the short term is important to check the information assimilated, however, it does not mean that it will be kept along the time. In this study, the results demonstrated a significant reduction in the general knowledge of CHWs on hearing health, 15 months following the training. This finding shows the importance of

training these professionals continuously and not only in isolated moments, thus, reinforcing the relevance of PNEPS<sup>1</sup>.

The analysis of information retention can be accomplished through tasks of free or aided evocation and also through information recognition, being that recognition tests require less attention and fewer cognitive resources, allowing greater support in the search and recovery of the information<sup>18</sup>. In



this study, the questionnaire focused on the task of information recognition, since it was constituted by statements that the participant should judge as true or false, i.e., developed contents were presented in the questions, which may have been a facilitator for evocation of the correct answer.

No studies analyzing information retention in CHWs training programs were found in the literature. The analysis of studies related to the retention of information transmitted to patients in other areas of health<sup>8-20</sup> as well as in Audiologia<sup>21,22</sup>, showed loss of the information provided by health professionals and that, some patients evoked erroneous information regarding their health condition.

The capacity to retain information is influenced by a number of factors such as the amount of information and how it is acquired, the duration of exposure and the interventions in this process<sup>23</sup>. Thus, the organization of training programs focused on these factors is essential, since they can facilitate the ability to retain information when properly applied.

In addition, the absorption of knowledge is given by various communication channels, both verbal and nonverbal, and may involve reading, hearing, vision and practical execution of situations. According to the literature, the ratio of information retention differs according to the channel used and also, the greater the number of channels used, the greater this proportion. In general, individuals manage to retain 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see and hear, and 80% of what they see, hear and do<sup>23</sup>.

These aspects were taken into account in the training program the CHWs underwent, previously, since the interactive tele-education tool used provided different audiovisual aids and also allowed the CHWs to guide their own study, a feature inherent to the tool used, that allows the users to review the contents, according to their need and advance in their studies according to their pace of learning.

Thus, the results of this study showed that even administering factors which influence the retention capacity, there was a significant reduction of the information retained over time, demonstrating that other parameters should be considered.

The educational program Cybertutor – an internet based electronic tutor - besides using the methodology of problem-based learning (PBL) also features interactive resources and is being used not only by the distance learning programs, but also to complement traditional learning<sup>24</sup>.

This methodology aligns with the principles of adult education or andragogy, which is the art and science of helping adults learn, fostering learning

through experience, which gives meaning to education. Thus, adult education is self-directed and should be organized according to situations of life / work, instead of content unit<sup>25</sup>.

Other factors that could influence the retention level would be age, socioeconomic status and education, however, no significant correlations between education and level of information retention, as well as socio-economic status and the level of information retention were observed in a previous study conducted with patients in the area of Audiology<sup>22</sup>.

Demographic aspects were not analyzed in this study due to sample homogeneity, since the participants were in the same age range, occupation and level of education.

The literature shows that the information retention level is also related to the involvement of the individual and use of the information, that is, if not used frequently, the learnt content goes through the working memory and then is discarded. On the other hand, if such content is used routinely, it reaches the long-term memory and is retained<sup>26,27</sup>.

Although all CHWs performed their duties for 15 months, as determined by the

ESF, no rigorous control was imposed on the activities they undertook during that period, considering whether or not all CHWs had the same opportunity to apply the content. This would involve the scope of the performance area, number of households visited, contact with hearing impaired children, among others. Thus, further studies are necessary, so as to control the activities performed by these professionals, after training.

Faced with this with this limitation, we sought to verify evidence that could clarify the obtained findings. In this sense, the information retention level for different domains assessed by questionnaire was analyzed. The results showed a significant reduction of information for domain 1, which represents conceptual aspects, that are, therefore, more distant from the CHWs' daily performance.

On the other hand, the content assessed across the remaining domains consists in more practical aspects, and, therefore, the daily activities of these professionals may have favored the maintenance of the level of information retained for these domains, and even caused a slight improvement in the performance, in domain 4 (Table 1).

This finding is consistent with results reported in a previous study<sup>22</sup>, which shows that individuals have a greater ability to retain concrete information than abstract information. The conceptual aspects on hearing and hearing impairment represent the basis for CHWs to perform their technical/practical work in hearing health effectively, since they need

to know what hearing loss is, for them to work on its identification.

Thus, one notes that the results found in the analysis per domains can direct the structuring of continued education programs or even continued health education directed to SUS workers. The theoretical and conceptual aspects addressed in such educational processes must be constantly reinforced, since they get to the working memory, but it is difficult to maintain the level of information retained in the long term.

The retention of information related to infant hearing health allows CHWs to effectively contribute to promote hearing health as well as to develop preventive actions in the area. Studies aimed at verifying information retention through evocation tasks and investigating ways to improve the retention level in training programs directed to these professionals, are extremely important.

Being a dynamic educational process under construction and requiring the use of methodologies

that put the subjects as actors of this learning, the design of new research involving the training and retention of information for CHWs, in the Cybertutor's environment, should include other strategies such as problematization through simulation of everyday problem-situations discussion forums, among others. Support material such as a primer to help guide families and the register in the form of CHWs' reflective diaries, addressing the theme in home visits, may facilitate the applicability of information in their daily routine.

## ■ CONCLUSION

A significant reduction of the general knowledge of CHWs on infant hearing health was observed, thus, the training of these professionals should not take place in a single moment, but be based on a proposal for continuing health education, so as to provide greater possibilities for information retention and transformation of the reality in health.

## RESUMO

**Objetivo:** verificar a retenção das informações sobre saúde auditiva infantil por agentes comunitários de saúde que participaram de um curso de capacitação. **Métodos:** participaram do estudo 24 agentes comunitários de saúde que haviam sido capacitados por meio de um *Cybertutor*, sistema de ensino baseado na web. O conteúdo programático desta capacitação envolveu informações que versaram desde a prevenção à reabilitação da deficiência auditiva. Imediatamente após a capacitação, os agentes comunitários de saúde responderam um questionário de múltipla escolha contendo 20 questões, divididas em domínios (1: conceitos gerais; 2: tipo, prevenção e causas da deficiência auditiva; 3: técnicas de detecção e identificação da deficiência auditiva; 4: aspectos gerais da deficiência auditiva). Os agentes comunitários de saúde responderam novamente o questionário decorridos 15 meses da capacitação. O nível de retenção das informações foi analisado comparando o desempenho nos dois momentos por meio do teste de Wilcoxon e adotando-se nível de significância de 5%. **Resultados:** houve uma redução significativa ( $p=0,03$ ) em percentual, do conhecimento geral dos agentes comunitários de saúde sobre saúde auditiva infantil ( $73,5 \pm 8,4/66,7 \pm 12,5$ ). Na análise por domínios foi possível constatar uma piora nos domínios 1 ( $76,4 \pm 14,7/58,3 \pm 22,5$ ), 2 ( $72,9 \pm 30,3/64,6 \pm 19,4$ ) e 3 ( $69,4 \pm 14,5/68,8 \pm 17,2$ ), sendo significativa para o domínio 1 ( $p=0,012$ ). No que se refere ao domínio 4, observou-se discreta melhora ( $76,0 \pm 11,6/78,1 \pm 11,2$ ). **Conclusão:** houve redução significativa, em percentual, do conhecimento geral dos agentes comunitários de saúde sobre saúde auditiva infantil, demonstrando a importância da educação continuada para estes profissionais.

**DESCRIPTORIOS:** Capacitação; Programa Saúde da Família; Retenção (Psicologia); Audição; Audiologia

## ■ REFERENCES

1. Brasil. Portaria GM/MS nº 198 de 13 de fevereiro de 2004. Institui a Política nacional de educação permanente em saúde como estratégia do Sistema Único de Saúde para formação e desenvolvimento de trabalhadores para o setor. Diário Oficial da Republica Federativa do Brasil. 2004. Seção 1:24.
2. Ceccim RB, Feuerwerker LCM. O quadrilátero da formação para a área da saúde: ensino, gestão, atenção e controle social. *Physis*. 2004;14(1):41-65.
3. Brasil. Ministério da Saúde. Uma nova escola médica para um novo sistema de saúde: Saúde e Educação lançam programa para mudar o currículo de medicina. *Rev Saúde Pública*. 2002;36(3):375-8.
4. Brasil. Portaria nº 793 de 24 de abril de 2012. Institui a Rede de Cuidados à Pessoa com Deficiência no âmbito do Sistema Único de Saúde. 2012. Diário oficial da República Federativa do Brasil. 2012.
5. Frazão P, Marques D. Efetividade de programa de agentes comunitários na promoção da saúde bucal. *Rev Saúde Pública*. 2009;43(3):463-71.
6. Hermann K, Damme WV, Pariyo GW, Schouten E, Assefa Y, Cirera A et al. Community health workers for ART in sub-Saharan Africa: learning from experience – capitalizing on new opportunities. *Human Resources for Health*. 2009;7:31-42.
7. Kalyango JN, Rutebemberwa E, Alfvén T, Ssali S, Peterson S, Karamagi C. Performance of community health workers under integrated community case management of childhood illnesses in eastern Uganda. *Malaria Journal*. 2012; 11:282-95.
8. Berretin-Félix G, Ferrari DV, Daré S, Wen CL. Teleamentação para Agentes Comunitários de Saúde – 10 passos para comunicação e deglutição do bebê. [Cybertutor] Bauru: Telemedicina – Faculdade de Medicina da Universidade de São Paulo; 2009.
9. Arakawa AM, Sitta EI, Maia Junior AFM, Carleto NG, Santo CE, Bastos RS et al. Avaliação de um programa de capacitação em fonoaudiologia para agentes comunitários de saúde na Amazônia brasileira. *Distúrb Comun*. 2013;25(2):203-10.
10. World Health Organization (WHO). Prevention of deafness and hearing impairment. Disponível em: [http://www.who.int/pbd/deafness/en/survey\\_countries.gif](http://www.who.int/pbd/deafness/en/survey_countries.gif). Acesso em: 01 de novembro de 2013.
11. IBGE. Censo Demográfico 2010. Disponível em: <http://www.censo2010.ibge.gov.br>. Acesso em: 01 de novembro de 2013.
12. Bevilacqua MC, Alvarenga KF, Costa OA, Moret AL. The universal newborn hearing screening in Brazil: from identification to intervention. *Int J Pediatr Otorhinolaryngol*. 2010;74(5):510-5.
13. Organização Mundial de Saúde. The report of the International Workshop on Primary Ear and Hearing Care – Cape Town, South Africa. 1998.
14. Alvarenga KF, Bevilacqua MC, Martinez MANS, Melo TM, Blasca WQ, Taga MFL. Proposta para capacitação de agentes comunitários de saúde em saúde auditiva. *Pró Fono R Atual Cient*. 2008;20(3):171-6.
15. Melo TM, Alvarenga KF, Blasca WQ, Taga MFL. Capacitação de agentes comunitários de saúde em saúde auditiva: efetividade da videoconferência. *Pró Fono R Atual Cient*. 2010;22(2):139-45.
16. Alvarenga KF. Capacitação dos agentes comunitários de saúde do Programa de Saúde da Família: uma proposta de educação à distância na área de saúde auditiva. 2010. Bauru (SP): Universidade de São Paulo, Faculdade de Odontologia de Bauru. [Relatório final]: Processo CNPq n. 485508/2007-9.
17. Araújo ES, Alvarenga KF, Urnau D, Pagnossin DF, Wen CL. Community health worker training for infant hearing health: effectiveness of distance learning. *Int J Audiol*. 2013;52(9):636-41.
18. Thompson AE, Goldszmidt MA, Schwartz AJ, Bashook PG. A randomized trial of pictorial versus prose-based medication information. *Patient Educ Couns*. 2010;78(3):389-93.
19. Ayotte BJ, Allaire JC, Bosworth H. The associations of patient demographic characteristics and health information recall: the mediating role of health literacy. *Neuropsychol Dev Cogn B Aging Neuropsychol Cogn*. 2009;16(4):419-32.
20. Wilson EAH, Park DC, Curtis LM, Cameron KA, Clayman ML, Makoul G et al. Media and memory: The efficacy of video and print materials for promoting patient education about asthma. *Patient Educ Couns*. 2010;80(3):393-8.
21. Desjardins JL, Doherty KA. Do experienced hearing aid users know how to use their hearing aids correctly? *Am J Audiol*. 2009;18(1):69-76.
22. Geraldo T, Ferrari DV, Bastos BG. Orientação ao usuário de prótese auditiva: retenção da informação. *Arq. Int. Otorrinolaringol*. 2011;15(4):410-7.
23. Pazin Filho A, Scarpelini S. Estrutura de uma aula teórica I: conteúdo. *Medicina* 2007;40(1):17-27.
24. Ferrari DV, Blasca WQ, Bevilacqua MC, Wen CL. Audiology telehealth research in Brazil. *Audinews*. 2008;8(57):4-5.



25. Knowles, M. Self-Directed Learning: A Guide for Learners and Teachers. New York: Association Press, 1975.
26. Ioschpe G. A visão evolutiva do aprendizado. Revista veja 20 de março de 2013: 94-6.
27. Wilson EAH, Wolf MS. Working memory and the design of health materials: a cognitive factors perspective. Patient Educ Couns. 2009;74(3):318-22.

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