Original Article

http://doi.org/10.1590/2317-6431-2016-1809

Audiology Communication Research
ISSN 2317-6431

Group activity as an educational hearing-health strategy with workers of a hospital maintenance service

Atividade de grupo como estratégia de educação em saúde auditiva de trabalhadores de um serviço de manutenção hospitalar

Flávia Elisa Antunes Lemes de Oliveira Ramos[1], Adriana Bender Moreira de Lacerda[1], Vânia Muniz Néquer Soares[2], Mariluci Hautsch Willig[3]

ABSTRACT

Introduction: Noise-induced hearing loss requires actions to promote hearing health and risk prevention, and education of workers, a major factor for reducing this disease. **Purpose:** To describe an educational hearing-health intervention with workers of a hospital maintenance service through group activities grounded in the problem-solving pedagogy. **Methods:** Intervention study with a qualitative approach. Group activity technique was adopted for the educational action, and the problem-solving pedagogy was developed in its three phases: synchresis, analysis and synthesis. Five group activities were carried out, having the participation of ten workers of a large hospital maintenance service. Data were collected from participants' accounts and analyzed by means of thematic content analysis. **Results:** Educational intervention promoted the interaction between workers and moderators, as well as their joint desire of building a proposal for hearing health promotion from their experienced reality in the hospital maintenance settings. It was possible to re-mean maintenance practice by identifying risks and solutions, changing actions were also proposed through reflection, aiming at promoting workers' hearing health, mainly by the use of hearing protection. **Conclusion:** The intervention contributed to knowledge building, education and development of workers' critical awareness on the hearing health theme.

Keywords: Noise; Health education; Occupational health

RESUMO

Introdução: A perda auditiva induzida por ruído requer medidas de promoção à saúde auditiva e prevenção dos riscos, sendo a educação dos trabalhadores um fator primordial para redução desse agravo. **Objetivo:** Descrever uma intervenção de educação em saúde auditiva com trabalhadores de um serviço de manutenção hospitalar, por meio de atividades em grupo, fundamentadas na pedagogia problematizadora. **Métodos:** Para a ação educativa, adotou-se a técnica de atividades em grupo e desenvolveu-se a pedagogia problematizadora em suas três fases: síncrese, análise e síntese. Foram realizadas cinco atividades de grupo, com a participação de dez trabalhadores de um serviço de manutenção de um hospital de grande porte. Os dados foram obtidos de acordo com as falas dos participantes e avaliados com base na análise de conteúdo na modalidade temática. **Resultados:** A prática educativa promoveu a interação entre os trabalhadores e moderadores, bem como o desejo comum de construírem uma proposta para a promoção da saúde auditiva no ambiente da manutenção hospitalar, com fundamento na realidade vivenciada. Foi possível ressignificar a prática no serviço de manutenção, identificando riscos e soluções e, a partir da reflexão, propor ações transformadoras, com vistas à promoção da saúde auditiva dos trabalhadores, principalmente o uso de protetores auditivos. **Conclusão:** A intervenção contribuiu para a construção do conhecimento, a formação e o desenvolvimento da consciência crítica dos trabalhadores sobre a temática da saúde auditiva.

Palavras-chave: Ruído; Educação em saúde; Saúde do trabalhador

Study held in the Post-graduation Program on Communication Disorders, Universidade Tuiuti do Paraná – UTP – Curitiba (PR), Brazil.
(1) Post-graduation Program on Communication Disorders, Universidade Tuiuti do Paraná – UTP – Curitiba (PR), Brazil.
(2) Health Secretary of Paraná State – SESA – Curitiba (PR), Brazil.
(3) Nursing Post-graduation Program (Professional Master's Degree), Universidade Federal do Paraná – UFPR – Curitiba (PR), Brazil.
Conflict of interests: No
Authors' contribution: *FEALOR* research elaboration, literature review, data collection and analysis, article submission and proceedings; *ABML* research counseling, correction of the data analysis, writing and article correction, approval of the final version. *VMNS* e *MHW* article writing and correction, approval of the final version.
Corresponding author: Flávia Elisa Antunes Lemes de Oliveira Ramos. E-mail: fla-elisa@hotmail.com
Received: 12/8/2016; **Accepted:** 4/24/2017

INTRODUCTION

Historically, the increase of noise exposition was evidenced with the development of the industrialized society, work transformation and its organization at the end of the nineteenth century. Such a change to the industrial period triggered a model of development based on capital accumulation and laborforce exploitation, thus featuring work division, fast pace and adoption of new technologies, consequently depriving workers from their knowledge and creative skills[1].

People, in particular, woodworkers, locksmiths, mechanics, among others, were daily exposed to loud noise in their work settings. Noise-induced hearing loss (NIHL) impairs hearing health as well as other bodily organs and functions[2].

NIHL is considered the highest-incidence condition on workers' health of several fields of industrial activities, causing untreatable, though completely preventable impairments[2,3].

Research studies carried out in hospital settings showed the existence of several occupational hazards, among them physical hazards, such as noise and its effect on hearing, uncovering the need of implementing hearing conservation programs[4,5,6,7,8].

Authors suggested education on noise and its effects in order to promote hearing health and NIHL prevention, and also hospital noise monitoring, equipment sound adaptation, architectural adjustments and managers' involvement[6].

In this context, the promotion of hearing health aims to develop hazard awareness and points out the importance of hearing health for quality of life and well being, bringing about reflection, critical thinking and the sense of responsibility in the populations cared within the speech language therapy scope[9].

The First International Conference on Health Promotion held in Ottawa (Canada) in November of 1986, which put forth the Ottawa Charter of 1986, defined health promotion as "the process of enabling community/individual to act over and improve their quality of life and health, including greater participation in this process control"[10].

In this perspective, health concept is understood as the expression of objective life situations resulting from housing conditions, food, education, income, environment, work, transport, job, leisure, freedom, access to and land owning, and access to healthcare services, according to Law 8080, which rules over Brazilian Health System[11].

Health education is a consequent process to all health practices, not only its promotion, but also disease prevention and treatment, being considered an essential strategy in the process of individual and collective awareness of the society.

Health education is understood as a "social practice whose process contributes to the arousal of people's critical awareness on health problems within their reality, and encourages the search of solutions as well as organization of individual and collective actions"[12].

In order to deliver occupational education, educators must not only master the specific content, but also consider pedagogical conceptions, which include the related processes of teaching-learning, resulting in critical thinking and transformation of the work reality, aiming at health conservation, occupational disease prevention and life conditions in general[13].

Educational interventions are an essential part of the Hearing Loss Prevention Program as they aim to make workers aware of the consequences of hazardous agents to their hearing and general health in work settings as well as the consequential preventive measures for hearing conservation[14].

Work environment is a privileged setting for educational interventions towards health promotion and protection, as it is the organizational space where people stay the greatest part of their time. It is this environment which must provide workers with the chance to think over their health, quality of life and work situations in order to bring about safer and more stimulating conditions[15].

Regarding health education methodologies, literature has pointed out problem-solving pedagogy, which assumes that in a fast-changing world, knowledge and ideas are not important, neither are the expected correct and easy behaviors, but the increase in the subject's ability, participant and agent of the social transformation, to detect actual problems and search original, creative solutions for them. In this model, the intended ability to be developed with the subjects is to ask relevant or meaningful questions, for them to be able to understand them and properly solve them, that is, to promote problematization of themes that subjects are interested in, and go after joint solutions[13].

Therefore, problem-solving pedagogy evolves as an educational method which fosters active, critical-thought provoking participation, with steady relentlessness and social change promotion, stressing dialogue and knowledge exchange[16].

Problem-solving pedagogy is grounded in the forms of developing the learning process, using actual or simulated experiences in order to solve the challenges evolving from the essential activities of the social practice. Participants confront the problems and/or challenges that mobilize their intellectual capacity, while they go over them so that they can grab and solve them. For that, they need information in order to encourage them to work, elaborating and re-elaborating such information according to what they need to respond to or consider[17].

This way, it may gradually occur the development of the scientific spirit, the critical thinking, the reasoning, ethical values, among other achievements of the kind by means of education in different levels, contributing to the development of the autonomy[17].

This educational model was drawn from Paulo Freire's educational method, and has stood out as a teaching-learning

methodology for different populational groups, especially in the health area. Teamwork is a methodological resource which fits well the problem-solving model because it facilitates the disruption from the traditional top-down relation between the health professional and the subject suffering his/her intervention, being a facilitating technique for the individual and collective expression. of his/her needs, expectations and life circumstances influencing health[18].

Group activities are a participating method, which facilitates personal and interpersonal thought-provoking processes with positive results being identified. They are based upon the creation of a playful, free environment, committed to and making learning motivation evolve. In participating activities, participants are protagonists, active agents and actors of their own story. The dynamism in the application of the techniques fosters commitments as well as the critical thinking in the process of awareness, enabling the re-meaning of emotions, values and knowledge[19].

The current study objectifies to describe an educational intervention on hearing health with workers from a hospital maintenance service, using group activities and the problem-solving pedagogy as teaching-learning strategies.

METHODS

The research study was approved by the Research Ethics Board of the *Hospital de Clínicas, Universidade Federal do Paraná*, under register number 32003014.9.3001.0096. The hospital maintenance professionals were invited to participate in the study and oriented on its objective. All the research participants signed the Free Informed Consent Form.

It is an intervention study with qualitative approach, carried out at a hospital maintenance service of a large hospital located in the municipality of Curitiba (Paraná State, Brazil).

Hospital maintenance is part of the infra-structure unit of the hospital under study, and its purpose is to provide physical conditions, comfort and safety to the hospital, according to the demands of the Health Surveillance Department and the recommended standards for health care institutions. Eighty-six (86) employees worked at the hospital maintenance service under varied employment relationships, being three of them employed after a contest by the university presidency, 16 were hired by a foundation, and 67 were hired by an outsourced company, being the two latter job relations under the Consolidation of Brazilian Labor Laws.

The outsourced company provides several programs related to workers' health and safety: Prevention Program of Environmental Risks, Medical Control Program for Occupational Health and the Hearing Conservation Program. The Foundation provides the Prevention Program of Environmental Risks, and the Medical Control Program for Occupational Health. The university presidency's office carries out periodical physical exams as well as yearly audiometry exam, and all the employment relationships recommend the use of individual safety equipment, including hearing protection during occupational noise exposure above 85 dBA. In many sectors of the hospital maintenance department, noise was superior to 85 dBA, according to the Hearing Loss Prevention Program.

The sample comprised ten male subjects, who voluntarily accepted to participate in the group activities, and were released by their superiors. They performed occupational activities in sectors such as woodwork, metal work, boiler, gardening, industrial mechanics and painting. One of them was hired by the foundation, and nine were hired by the outsourced company. All of them worked in sectors with noise levels equal to or above 85 dBA, according to the Prevention Program of Occupational Risks. Workers who were out on vacation or sick leave, the ones who worked in other sectors, the ones who did not get their superiors' permission, the ones who were not exposed to noise levels equal to or above 80 dBA, and the ones who did not accept to participate in the study, were not invited.

The development of educational interventions was based on the problem-solving pedagogical model and techniques of group activities.

Five educational group meetings were held, once a week, one hour long, mediated by a nurse and a speech language therapist. The discussions of the group activities were recorded and their production was transcribed and analyzed as the result of the qualitative step of the Master's Degree dissertation titled "Group Activity as an educational strategy on hearing health of workers from a hospital maintenance service", Post-graduation course on Communication Disorders[20].

Educational intervention and data collection were carried out between February and April of 2015. The setting for the group activities was the hospital maintenance cafeteria where there was a long table, enabling the organization of the participants in a circle, and the time length of each meeting was controlled by the researcher.

Being active pedagogy, during the group activities, different kinds of dynamics were performed (rounds of conversation, posters were made, photos, films, analyses of the results of audiometry exams, practice in the use of hearing protectors, among others), aiming at approaching the group subjects and the researcher.

The problem-solving pedagogical process was developed according to the three phases proposed by Bordenave and Pereira[18]: synchresis, analysis and synthesis (Chart 1).

The data collected in the groups (participants' speeches) were analyzed by the researchers (nurse and speech language therapist), according to the thematic analysis proposed by Bardin[21]. In order to keep participants' anonymity, they were identified by the capital "T" letter followed by a cardinal number.

Chart 1. Synthesis of the meetings held with hospital maintenance workers

Meetings	Guiding questions	Techniques
1st Meeting Phase of synchresis – Observation of the reality	What is your workplace like? Do you consider your workplace dangerous? What are the existing hazards at your workplace?	Identification of hazards present at the workplace (noise, chemicals, saw dust, blades, others); record, with photos, of hazardous situations at the workplace; free discussion for the participants to express their knowledge, feelings, beliefs and values in relation to noise and its health outcomes.
2nd Meeting Phase of analysis - Key point: Noise	What are the sources of noise in your workplace?	Group reflection on the observed situation; accounts of situations and experiences, as well as photos of hazardous situations also contributed to problematize the discussion, arising other questions by the participants.
3rd Meeting Proceeding with the phase of analysis Key point: Hearing	Do you know how hearing works? What is the NIHL impact on daily life?	Video presentation on how the auditory system works and on NIHL; ear anatomy and functions; noise outcomes on general and hearing health; account on workers' frequent complaints and description of the impact of NIHL on daily life; NIHL definition and treatment and other causes for hearing loss; guidance to workers' audiometry results and comparison with other examples. From the techniques used, the second key point was identified: Hearing.
4th Meeting Proceeding with the phase of analysis Key point: Prevention	Do you know how to prevent the noise effects on your hearing?	Discussion of the need to prevent NIHL; identification of workers' knowledge on collective and individual preventive measures, and on hearing protection equipment; presentation of three videos on hearing protectors and development of a practical activity with hearing protectors (shell-like and plugs) by the workers themselves.
5th Meeting Phase of theorizing Solution hypotheses	From the subjects discussed in the four meetings, what preventive measures from the noise effects on hearing that could be adopted at your workplace? How did the group contribute to foster care towards hearing health conservation?	Discussion of the proposed measures by the group on the reduction of the noise effects at the workplace and prevention from hearing impairments; survey among the workers on the meetings contribution to improve and protect general and hearing health.

RESULTS

The demonstrated results refer to the description of the educational intervention, according to the phases of the problem-solving pedagogy (synchresis, analysis and synthesis), and the analysis of the qualitative data obtained from the workers' speeches regarding their hearing health after the intervention.

The first group activity aimed to identify workers' reality and entailed the phase of synchresis. Therefore, guiding questions were used, which enabled free discussion and reasoning on the work conditions and their health hazards. From this activity, workers were requested to take pictures of hazardous situations at their workplace for their next meeting.

By analyzing the speeches and reflections using thematic analysis, they could apprehend four theme categories, which showed health hazards of the workers at the maintenance service, according to the group perception. They were as follows:

- *The job is dangerous.* The machinery and workplace are hazardous to health, according to the speeches and photos. One of the workers reported as follows: *"The boiler, besides the steam, still has hot water that may cause burns, […] blow up […] uau! […] That's very dangerous."* (T1)
- *Steady noise bothers.* Noise sources, the machines used at workplace, were identified by the workers and reported as: *"Steady noise from the boiler, the ironing machine has deafening noise. There's the multi-cutter saw. The boiler discharge ... is like a plane turbine".* (T7)
- *Frequent contact with chemicals.* Workers are in daily contact with different kinds of chemicals depending on the place they work. They reported: *"There is glue, which is a chemical, there is solvent".* (T8); (T9); (T10)
- *Improper weight, height and place.* The use of ladders, carrying and transport of heavy materials, and improper

place were considered health hazards: *"I often work in high places, roof, I also need to lift heavy materials"*. (T6)

As in the first group activity, the theme and interest, on the part of the workers, came up about noise at the workplace; in the second and third group activities, the key points were noise and hearing. Therefore, the guiding questions were, respectively: What are the noise sources at your workplace? Do you know how hearing works and what is the impact of noise-induced hearing loss?

The second, third and fourth activities comprised the *analysis phase* in order to deepen the group knowledge, also called the theorizing phase. In this phase, workers' knowledge on the problems reported was identified, and by means of group dynamics (photos of noisy machines, videos on how hearing works, posters making), noise-related themes, noise sources at the workplace and their risk for general and hearing health were discussed. For example, a participant showed photos and a video with the hazardous situation of a workmate using a machine at work, thus enabling the debate and discussion among all participants, generating several other examples, related to similar hazardous situations experienced by them.

After speech analysis in this phase, the following theme categories were identified, apprehending previous knowledge as well as the knowledge developed with the broad reflection encouraged by the group dynamics, evidencing workers' protagonism:

- *Impaired hearing, difficulty in communication.* Impaired hearing impacts workers' health, social and family contexts, specially their communication, according to what was reported by the workers: *I don't like to answer the phone at home because I can't listen to it. I misunderstand what people say...".* (T2); *"[...] sick leave. It takes long to get the payments due to sick leave under the Social Security (INSS), and you miss health hazards-related payments. Also the songs you like to listen to [...]".* (T6); "*Losing hearing is like losing a God gift. I'd withdraw from the chats, people and social networking. I love music. Imagine if I couldn't hear anymore?"*(T7)

Proceeding to the analysis or theorizing phase, in the fourth meeting, individual and collective preventive measures related to the NIHL were discussed.

In this activity, the need to prevent NIHL, workers' identification of preventive measures and individual hearing protection were discussed. At the end of the meeting, a video on the use of hearing protection was shown, with a practical training on the equipment being held, with aspects regarding putting it on, taking it off, replacement, maintenance and cleaning.

From the speech analysis, in this phase, the following thematic category was apprehended:

- *Hearing care – Prevention.* Workers' perception on the need to adopt preventive measures and use of Individual Protection Equipment, which prevents hearing impairment, was that they are attitudes to protect health: *"Firstly, use the protectors, and then avoid remaining in noisy places that may impair hearing. As for the protection, when you're working and you're gonna cut something, … put on the protector to prevent hearing loss. I've already had mild hearing loss".* (T2) *"The best protection is awareness. You have to wear the protector".* (T5) *"At home, turn down the volume of the things, radio, TV". "At work, the machine is on, you have to wear the hearing protector, the glasses".* (T4) *"[...] Discharge the boiler when not everybody is here".* (T5) *"Get a sound level meter and go measuring the sound levels here".* (T2)

In the *synthesis phase,* carried out in the fifth meeting, two guiding questions were used after the subjects addressed in the former four meetings: What preventive measures for the noise effects on hearing could be adopted at your workplace? How did the group contribute to foster care in order to keep your hearing health?

Based on the answers to those guiding questions, hypotheses to solve the noise problem came up, according to the reality observed by the workers, which included not only the occupational noise, but also out of their workplace, being identified the following thematic category:

- *Replicating information, encouraging the use of protectors.* For the workers who participated in the group activity, the educational interventions were relevant to make them aware of the use of hearing protectors, aiming at protection and health promotion, as their speeches reported:
  "We learned that we should never perform any kind of noisy tasks, either at work, or at school without the ear protector. We've even seen some workers, who did not participate in the group, not wearing the protectors, and we've been talking to them so that they wear them. We have the habit to say: we're just going to make a little cut in the disk. Then, it takes only 3 minutes, but these 3 minutes are enough for a negative outcome to your hearing. Our major problem was lack of information on hearing loss. If I'd had such information, I'd have taken more care of my hearing. You have to take profit from what you learned". (T2) *"It was great. Now, more and more we've been wearing the protector. We would do the maintenance on the (hospital) floors, we used the drill and was going to use the driver. I did not use to wear the ear plugs, now we're taking them too."* (T3). *"It helped me, because when it was a small task, I didn't use to wear them with the machine on, now I do".* (T4) *"I think it helps, as they said: I'm going quickly there, then I won't wear the protector. Listening to the right thing to do here, you end up wearing them more often. Then it's been worth it. Many times, it's lack of information, mainly in construction. It's hard to have someone doing the same as you're doing. A "brief course" like this one helps a lot since you participate, and put it*

in practice". (T5) *"It happened to a workmate of mine working with a shell-like protector, here on the head. We told him that after some time he would suffer from hearing loss. After the experience with this group, we can pass on what we learned here"*. (T7). *"I got surprised with that video he played. I didn't know our ears were such powerful machines. On wearing protectors, the same thing, we got more aware, and we're wearing them better now"*. (T9). *"I didn't use to wear the protectors for each mild noise. Now, I'm wearing them more often, because I could feel the difference of noise levels in there"*. (T10)

DISCUSSION

The educational intervention held with the participants in this study, different from the traditional health education model, which aims at the vertical sharing of knowledge on hygiene and health rules, promoted the wide participation of workers, thinking over the reality experienced in hospital maintenance settings. By theorizing with active learning dynamics, it was possible to get group proposals in order to cope with the noise problem, as well as solutions for hearing health conservation[18].

Besides noise, emphatically identified by the workers in the phase of synchresis, another recognized hazardous factor was the chemicals, as depending on the place and type of task to be performed, these workers get in contact with shale oil, sulphuric acid, Cupran paint remover, thinner, paint, glue and solvent. It is worth pointing out that the chemical hazards that woodworkers are exposed to may impair their hearing health, once they are concomitantly exposed to noise and solvent[22].

Workers' critical awareness on general hazards and noise-related hazards by means of prevention programs including educational interventions with active learning methodologies, is paramount for the promotion of hearing and general health. Educational activities are carefully planned with strategies and dynamics that allow workers to be protagonists, thus facilitating the educational process[6].

To approach the problematics of loud sound levels at the workplace, workers must perceive, by means of reflection, that occupational noise exposure may impair their own health. This theme must be addressed in the light of the losses that may have, which will affect their quality of life, bringing about hearing, organic, psychological and social changes[23].

It is understood that hospital setting workers need to know the risks that they are exposed to in order to be able to adopt preventive measures.

Regarding the machine-related noise, it was observed in the workers' accounts that most of them identified such noise hazard. Workers' perception on noise hazards was confirmed in the institutional document Hearing Loss Prevention Program, and in the quantitative study held in the place[20], showing that hospital maintenance is a workplace with loud sound levels, therefore there is real need to adopt preventive measures to eliminate or control this agent to protect exposed workers' hearing and general health.

The themes addressed in the educational interventions for prevention of hearing losses in the phase of analysis or theorizing are basically applicable to any populations. The way that such themes will be addressed, will vary according to the way each person gets and understands the information given, that is why it is fundamental to observe and study the target-population of the interventions[24].

In the phase of synthesis, besides the solutions to reduce noise at the workplace, it was stressed that noise control needs to be carried out by means of a set of preventive measures, giving them priority in order to reduce the noise in the source or along the way, or even with individual measures by means of the use of Individual Protection Equipment to reduce hearing loss hazards[22].

Excessively noisy environment, with sound pressure level above 85 dB, without any safety measures for the exposed workers to it, may impair the auditory pathways to the central nervous system[25]. The potentially harmful effects of noise to health, particularly to hearing health, stress the need of investment in management, actions and ongoing process of assessing Hearing Loss Prevention Programs in companies and other workplaces[26].

It was verified in the workers' speeches, complaints related to lack of information on occupational noise-related hearing loss. They also referred that they missed awareness on the use of hearing protection, even to perform short-time tasks, need of dialogue on the obtained knowledge with other workmates who did not participate in the group activities, highlighting the fact that the resources and strategies used evidenced critical awareness and learning.

Educators and learners need to find a new reference point able to overcome uncertainties and social contradictions in order to go beyond reductionist teaching-learning models, and search for the new, pursuing the construction of critical human interacting, politically engaged and socially transforming personalities. They need to shift from teaching-centered learning to an active, dialogical, interactive pedagogy[27]. Problem-solving education by Paulo Freire advocates the respect for the dialogue and the union between action and reflection, and it is based on the teaching act without knowledge or content transfer, encouraging the creation of conditions for its production or construction by means of an educational process based on dialogicity[28].

Contextualized problematization, associating theory and practice, has enabled and developed the 'learn to learn', 'learn to do', 'learn to be', 'learn to interact'. Understanding a practical problem and trying to find solutions to it encourage participation and open space to knowledge and experience exchange between educators and learners in their pursuit for learning, allowing to contextualize the thematics to be studied,

and develop students' critical awareness and empowerment, thus contributing to learning as well as changes in the service practice[28].

CONCLUSION

Educational group intervention, grounded in the problem-solving pedagogic model is an effective methodological resource to develop critical awareness and sense of responsibility of hospital maintenance workers, knowledge building on hearing health and its importance, in addition to noise-induced hearing loss prevention.

Further studies are recommended, and educational interventions should be expanded to all hospital maintenance workers, exposed or not to noise levels above 80 dBA.

REFERENCES

1. Meira TC, Ferrite S, Cavalcante F, Corrêa MJM. Exposição ao ruído ocupacional: reflexões a partir do campo da Saúde do Trabalhador. InterfacEHS. 2012;7(3):26-45.
2. Silva MC, Luz VB, GIL D. Ruído em hospital universitário: impacto na qualidade de vida. Audiol Commun Res. 2013;18(2):109-19. https://doi.org/10.1590/S2317-64312013000200009
3. Farias VHV, Buriti AKL, Rosa MRD. Ocorrência de perda auditiva induzida pelo ruído em carpinteiros. Rev CEFAC. 2012;14(3):413-22. https://doi.org/10.1590/S1516-18462011005000119
4. Costa GL, Lacerda ABM, Marques JM. Ruído no contexto hospitalar: impacto na saúde dos profissionais de enfermagem. Revista CEFAC. 2013;15(3):642-52. https://doi.org/10.1590/S1516-18462013005000012
5. Fontoura FP, Gonçalves CGO, Lacerda ABM, Coifman H. Efeitos do ruído na audição de trabalhadores de lavanderia hospitalar. Rev CEFAC. 2014;16(2):395-404. https://doi.org/10.1590/1982-0216201414012
6. Filus WA, Pivatto LF, Fontoura FP, Koga MRV, Albizu EJ, Soares VMN et al. Ruído e seus impactos nos hospitais brasileiros: uma revisão de literatura. Rev CEFAC. 2014;16(1):307-17. https://doi.org/10.1590/1982-021620140412
7. Fontoura FP, Gonçalves CGO, Soares VN. Condições e ambiente de trabalho em uma lavanderia hospitalar: percepção dos trabalhadores. Rev Bras Saúde Ocup. 2016;41(5):e5. https://doi.org/10.1590/2317-6369000097414
8. Silveira VL, Camara VM, Rosalino CMV. Aplicação da audiometria troncoencefálica na detecção de perdas auditivas retrococleares em trabalhadores de manutenção hospitalar expostos a ruído. Cienc Saúde Coletiva. 2011;16(2):689-98. https://doi.org/10.1590/S1413-81232011000200033
9. Lacerda ABM, Soares VMN, Gonçalves CGO, Lopes FC, Testoni R. Oficinas educativas como estratégia de promoção da saúde auditiva do adolescente: estudo exploratório. Audiol Commun Res. 2013;18(2):85-92. https://doi.org/10.1590/S2317-64312013000200006
10. World Health Organization - WHO. The Ottawa Charter for Health Promotion. 1st International Conference on Health Promotion; 1986 Nov 21; Ottawa. Geneva: WHO; 1986.
11. Fagundes CF, Monteiro FCD, Santos GJP, Assis L, Pas MV, Andrade PB. Relatório final. In: 8a Conferência Nacional de Saúde; 17-21 mar 1986; Brasília, DF. Brasília, DF: Ministério da Saúde; 1986.
12. Ministério da Saúde (BR). Fundação Nacional de Saúde - Funasa. Diretrizes de educação em saúde visando à promoção da saúde: documento base: documento I. Brasília, DF: Fundação Nacional de Saúde; 2007.
13. Bordenave JED. Alguns fatores pedagógicos. Rev Interam Educ Adultos. 1983;3(1-2).
14. United States Department of Labor. Occupational Safety and Health Administration - OSHA. Hearing conservation. Washington, DC: U.S. Departament of Labor; 2002. (OSHA 3074).
15. Cazón RL, Mafra C, Borges JM, Boger ME, Ildefonso SG, Souza V. Educação para saúde no trabalho. efdeportes.com. 2007 [acesso em: 2015 fev];12(112). Disponível em: http://www. efdeportes.com/efd112/educacao-para-saude-no-trabalho.htm
16. Oliveira DKS, Quaresma VSM, Pereira JA, Cunha ER. A arte de educar na área da saúde: experiências com metodologias ativas. Humanidades Inovação. 2015;2(1):70-9.
17. Berbel NAN. As metodologias ativas e a promoção da autonomia de estudantes. Semina: Cienc Sociais Humanas. 2011;32(1):25-40. https://doi.org/10.5433/1679-0383.2011v32n1p25
18. Bordenave JED, Pereira AM. Estratégias de ensino-aprendizagem. 33a. ed. Petrópolis: Vozes, 2015.
19. Lourenço B. Trabalho em grupos de adolescentes: reflexão em saúde. In: Secretaria Municipal da Saúde (SP). Manual de atenção à saúde do adolescente. São Paulo: Coordenação de Desenvolvimento de Programas e Políticas de Saúde; 2006. p. 57-60.
20. Ramos FEALO. Atividade de grupo como estratégia de educação em saúde auditiva de trabalhadores da manutenção hospitalar [dissertação]. Curitiba: Universidade Tuiuti do Paraná; 2016.
21. Bardin L. Análise de conteúdo. 7a ed. São Paulo: Edições 70; 2011.
22. Costa JB, Rosa SAB, Borges LL, Camarano MRH. Caracterização do perfil audiológico em trabalhadores expostos a ruídos ocupacionais. Estudos. 2015;42(3):273-87.
23. Moreira AC, Gonçalves CGO. A eficiência de oficinas em ações educativas na saúde auditiva realizadas com trabalhadores expostos ao ruído. Rev CEFAC. 2014;16(3):723-31. https://doi.org/10.1590/1982-021620146112
24. Heupa AB, Gonçalves CGO, Albizu EJ, Iantas MR, Lacerda ABM, Lobato DCB. Programa de prevenção de perdas auditivas em pescadores: perfil auditivo e ações educativas. Rev CEFAC. 2011;13(6):1009-16. https://doi.org/10.1590/S1516-18462011005000113
25. Cavalcante F, Ferrite S, Meira TC. Exposição ao ruído na indústria de transformação no Brasil. Rev CEFAC. 2013;15(5):1364-70. https://doi.org/10.1590/S1516-18462013005000021
26. Cintra JS. Reconhecimento, avaliação e controle de nível de pressão sonora (NPS) no posto de trabalho na área de produção de vapor de

uma empresa produtora de etanol e energia elétrica. Cognitio/Pós-Graduação Unilins. 2014;(1):1-34.

27. Araújo BBM, Rodrigues BMRD, Pacheco STA. A promoção do cuidado materno ao neonato prematuro: a perspectiva da educação problematizadora em saúde. Rev Enferm UERJ. 2015;23(1):128-31. https://doi.org/10.12957/reuerj.2015.14779

28. Siqueira MCG, Leopardi MT. O processo ensino-aprendizagem na formação de trabalhadores do SUS: reflexões a partir da experiência da ETSUS. Trab Educ Saúde. 2016;14(1):119-36. https://doi.org/10.1590/1981-7746-sip00094