CoDAS
ISSN 2317-1782 (Online version)

Original Article
Artigo Original

Educational intervention assessment aiming the hearing preservation of workers at a hospital laundry

Avaliação de intervenção educativa voltada à preservação auditiva de trabalhadores de uma lavanderia hospitalar

Francisca Pinheiro Fontoura[1,2]
Cláudia Giglio de Oliveira Gonçalves[1]
Mariluci Hautsch Willig[2]
Debora Lüders[1]

Keywords

Workers' Health
Occupational Noise
Laundry
Noise-induced Hearing Loss
Health Education

ABSTRACT

Objective: Evaluate the effectiveness of educational interventions on hearing health developed at a hospital laundry. **Methods**: Quantitative assessment conducted at a hospital laundry. The study sample comprised 80 workers of both genders divided into two groups: Study Group (SG) and Control Group (CG). The educational interventions in hearing preservation were evaluated based on a theoretical approach using the Participatory Problem-based Methodology in five workshops. To assess the results of the workshops, an instrument containing 36 questions on knowledge, attitudes, and practices in hearing preservation at work was used. Questionnaires A and B were applied prior to and one month after intervention, respectively. The answers to both questionnaires were analyzed by group according to gender and schooling. **Results**: Results of the pre-intervention phase showed low scores regarding knowledge about hearing health in the work setting for both groups, but significant improvement in knowledge was observed after intervention in the SG, with 77.7% of the answers presenting significant difference between the groups. There was also an improvement in the mean scores, with 35 responses (95.22%) presenting scores >4 (considered adequate). The women presented lower knowledge scores than the men; however, these differences were not observed in the SG after the workshops. Schooling was not a relevant factor in the assessment. **Conclusion**: The educational proposal grounded in the Participatory Problem-based Methodology expanded knowledge about hearing health at work among the participants.

Descritores

Saúde do Trabalhador
Ruído Ocupacional
Lavanderia
Perda Auditiva Provocada por Ruído
Educação em Saúde

RESUMO

Objetivo: Avaliar a efetividade das ações educativas em saúde auditiva desenvolvidas em uma lavanderia hospitalar. **Método:** Pesquisa avaliativa de abordagem quantitativa realizada numa lavanderia hospitalar. A população do estudo foi constituída por 80 trabalhadores, de ambos os gêneros, subdivididos em Grupo Intervenção GI e Grupo Sem Intervenção GSI. Foram avaliadas as ações educativas sobre preservação auditiva realizadas na abordagem teórica da Metodologia Problematizadora e Participativa, num total de 5 oficinas. Para avaliar os resultados das oficinas, foi utilizado um instrumento com 36 questões sobre conhecimentos, atitudes e práticas em preservação auditiva no trabalho. A Versão "A" foi aplicada antes da intervenção e a Versão "B", após um mês de seu término. Analisaram-se as respostas dos questionários A e B por grupos com e sem intervenção em relação ao gênero e escolaridade. **Resultados:** Os resultados encontrados na fase pré-intervenção demonstraram que os dois grupos apresentaram problemas no conhecimento relacionado à saúde auditiva no trabalho. Após a intervenção educativa, houve aumento significativo do conhecimento em relação à saúde auditiva no trabalho do GI com 77,77% das questões que apresentaram diferenças significantes entre os grupos. Houve melhora na média de pontuação com 35 (97,22%) questões apresentando pontuação maior que 4 (considerada resposta adequada). O gênero feminino apresentou conhecimentos inferiores ao masculino, porém, após as oficinas, essas diferenças não foram observadas no GI. A escolaridade não foi um fator relevante neste estudo. **Conclusão:** a proposta educativa pautada na metodologia problematizadora ampliou o conhecimento referente à saúde auditiva no trabalho entre os participantes.

Correspondence address:
Cláudia Giglio de Oliveira Gonçalves
Universidade Tuiuti do Paraná – UTP
Rua Sydnei Antonio Rangel Santos, nº 238, Santo Inácio, Curitiba (PR), Brazil, CEP: 82010-530.
E-mail: claudia.goncalves@utp.br

Received: November 14, 2016

Accepted: August 23, 2017

Study conducted at the Programa de Mestrado e Doutorado em Distúrbios da Comunicação, Universidade Tuiuti do Paraná – UTP - Curitiba (PR), Brazil.

[1] Universidade Tuiuti do Paraná – UTP - Curitiba, (PR), Brazil.

[2] Universidade Federal do Paraná – UFPR - Curitiba (PR), Brazil.

Financial support: nothing to declare.

Conflict of interests: nothing to declare.

INTRODUCTION

Prolonged exposure to loud noise levels (>80 dBA) can lead to health hazards such as hearing loss, tinnitus, physiological changes in heart rate and blood pressure, sleep disturbance, and various digestive, vestibular, neurological and behavioral disorders. Regarding hearing, impairment is permanent and, currently, there is no effective treatment for regeneration of the cochlea - the main site of injury caused by loud noise[1-3].

Because exposure to loud noise poses a potential risk to health and hearing, it is necessary to implement actions aiming to preserve hearing and promote health in work settings. Development of educational actions that promote awareness and knowledge about how to preserve hearing at the workplace is among these actions[4,5].

The specific scientific literature presents several studies on the development of interventions aimed at raising awareness of hearing protection in workers from different sectors, namely, [6,7], carpentry[8], hospitals[9,10], civil defense - firefighters[11], and food producing companies[12]. Hospital laundries, which are the object of the present study, are another occupational setting that presents risks to hearing[13]; however, no studies describing educational actions in this segment have been observed. Studies conducted in hospital laundries found that noise in these places exceed the acceptable maximum level described in the Brazilian labor legislation for an 8-hour day's work (85 dBA). According to these studies, the level of sound pressure observed in hospital laundries ranged from 85 to 101 dBA; they also reported that many workers did not make effective use of hearing protection devices (HPD) even though they were exposed to loud noise levels[13-15].

Therefore, the development of an awareness-raising educational practice is essential, that is, focused on development of critical consciousness of workers with respect to their health problems, stimulating the search for solutions and organization of collective action[4,16].

In this context, this study adopts a Health Education approach, understood as a set of knowledge and practices directed to disease prevention and Health Promotion[17]. Health Education is understood as a social practice, thus as a process that should contribute to the formation and development of critical awareness concerning health problems, motivating individuals to seek solutions to problems, both individually and in groups. Therefore, it should focus on the problematization of daily life, valuing the experiences of individuals and social groups. Educational practice proposed in this way does not involve only methods of persuasion or transfer of information, but rather a process of training and development of critical sense for transformation of the reality in which one lives, inserted in a participatory methodology. In this sense, adoption of a participatory methodology, as the one previously proposed, is only possible within approaches such as the so-called Critical, Renewed, or Problematizing Pedagogy and in the Critical Model[16,18]. The Critical Model is based on the assumption that the health and disease process is closely associated with socioeconomic and political determinants. Educational interventions should enable reflexive practice on the determinants of the health and disease process, provoking changes in the social context. This implies the adoption of strategies that enable participation and dialogic interaction between educators and learners. In this approach, the teaching-learning process will occur through a problematizing or awareness practice (Problem-based Methodology), whose theoretical and philosophical principles are based on humanism, phenomenology, and existentialism, and constitutes a methodological resource to conduct educational projects aimed at the development of critical awareness and freedom[16,19].

It is expected that the Educational Interventions developed under a perspective of the Problem-based Methodology have the capacity to modify a given health situation, meeting the health needs of this population, in this specific case, the workers of a hospital laundry. The laundry area is barely visible in a hospital, but it presents a high rate of occupational accidents and development of occupational diseases[10].

This study was motivated by the concern over an education practice that contributed to develop in hospital laundry workers awareness of the causes and consequences of hearing health problems caused by their work, thus seeking solutions.

Therefore, the objective of this study was to evaluate the effectiveness of educational interventions on hearing health developed in a hospital laundry.

METHODS

This is a quantitative assessment that analyzed educational interventions conducted with a group of workers at the laundry of a Federal Public Teaching Hospital located in Curitiba, Parana State, Brazil.

The study was approved by the Research Ethics Committee of the aforementioned Institution under protocol no. 310.522/06-2013. After receiving information on the purpose, justification, and methodology of the proposed research, all participants signed an Informed Consent Form (ICF) prior to study commencement. Workers who had been working at the hospital laundry for over a year and agreed to participate were included in the study. Exclusion criteria were as follows: not attending any of the workshops or having worked at the laundry for less than a year. The study sample was composed of 80 of the 102 individuals who worked at the laundry in the daytime, without distinction of gender and age.

The study population comprised individuals that worked in the clean and dirty areas of the laundry and were exposed to the following noise levels: clean areas that perform centrifugation (99 to 101 dBA), classification (85 dBA), drying (85 dBA), folding (84 dBA), and packaging (77 dBA) of clothing; dirty areas that perform weighing (89.8 dBA), classification (89.8 dBA), and washing (89.8 dBA) of clothing. The laundry workers had been on the job for 5.31 years on average.

These workers were divided into two groups: Study Group (SG), comprising 20 workers, randomly selected by the laundry supervisor, who participated in the educational workshops and Control Group (CG), composed of 60 workers who agreed to participate in the study, but did not attend the educational workshops.

Educational intervention occurred through workshops whose planning and structuring were guided by a theoretical approach of the Participatory Problem-based Methodology[16]. The educational workshops were held in two groups of 10 individuals, in weekly meetings of approximately 50 minutes, totaling five meetings per group. The following themes were addressed: Meeting 1: Identification of critical noise sources in the laundry room; Meeting 2: Consequences of exposure to noise in general health and effects of noise on the body and hearing; Meeting 3: Recognition of signs and symptoms of Noise-induced Hearing Loss **(**NIHL) and its consequences in extra-work life and quality of life; Meeting 4: Practical training on the correct use of the hearing protection device (HPD), including its cleaning, maintenance, and substitution; Meeting 5: Discussion on the control measures of oto-aggressive agents at work and elsewhere.

The educational workshops were conducted according to the following phases: Identification of the Educational Diagnosis (knowledge, attitudes, and practices), Planning and Structuring of the Workshops (plan of action), Development of the Workshops (action plan implementation), and Effectiveness Assessment of the Educational Interventions.

In order to assess the results obtained with respect to the knowledge and changes in attitude generated in the workers by the Educational Interventions, an instrument was prepared based on other instruments validated and referred to in the literature, namely, Beliefs and Attitudes on Hearing Loss Prevention questionnaire originally developed in the USA by the National Institute for Occupational Safety and Health (NIOSH)[20], which was translated and adapted to Brazilian Protuguese as *Questionário Crenças e Atitudes sobre Proteção Auditiva e Perda Auditiva*[21], and the tool Evaluation of the Effectiveness of Hearing Loss Prevention Programs developed by Bettega[22]. The structured instrument would fully meet the assessment needs of the Educational Intervention developed in the laundry, considering that the tools available in the literature did not fully fulfill this function. The instrument was prepared in two versions: Questionnaires A and B (Annex 1). They contained statements on the same content, but presented, in some items, in a different way regarding their writing in relation to being an affirmative or a negative statement, for application at two moments: pre- and post-educational intervention. This strategy enables verification of whether the observed results came effectively from the educational activity. They are, thus, the same instrument, but with different presentations so as not to make their answers automatic from the part of the respondents[22,23]. In this study, the questionnaire was applied using the face-to-face technique, which consists of the oral application by the interviewer. Questionnaire A was applied prior to the educational intervention, whereas Questionnaire B was administered after a month for both groups, with the latter version used to evaluate the results.

The instrument, which contained 36 statements in both versions, presents the following themes, grouping more than one item: 1) Knowledge about the causes of hearing loss at work (questions 1 and 10; 2) Perception of the consequences of hearing loss (questions 2 and 11); 3) Perception of the benefits of preventive action (questions 4, 13, and 19); 4) Conditions for using hearing protection devices (HPD) (questions 5, 6, 7, 14, 15, 16, 20, and 21); 5) Intention of the prevention behaviors (questions 8, 17, and 22); 6) Self-efficacy in the use of HPDs (questions 3, 9, 12, and 18); 7) Habits harmful to hearing (questions 23, 24, and 25); 8) Knowledge about the effects of noise on health and hearing (questions 26, 27, 28, 29, 30, 31, and 32); 9) Knowledge about hearing diagnosis (questions 33 and 34); 10) Knowledge about actions of the Hearing Preservation Program (questions 35 and 36). There is a possibility of closed answers, with five choices, which were scored according to the Likert scale as: 1-fully agree; 2-agree; 3-neither agree nor disagree; 4-disagree; 5-strongly disagree.

For data analysis, responses were considered adequate when the answer was "fully agree" or "agree" for the true statements and "strongly disagree" or "disagree" for the false statements; responses were considered inadequate when the answer was "strongly disagree" or "disagree" for the true statements and "fully agree" or "agree" for the false statements. The scores were assigned so that response values greater than three (3) indicated positive/adequate perception of the contents evaluated, responses with values equal to or very close to three suggest indifference, and values lower than three indicate negative/inadequate perception of the contents assessed.

Before the instrument was applied to the participants, a pilot test was conducted with a group of 20 workers who were not included in the study. The pilot test enabled adaptation of the instrument language, making it more understandable and appropriate to the population investigated. After the instrument was applied to the study participants, a reliability test was performed using the Cronbach's α coefficient, which measures the internal consistency of the questions. The result obtained was 0.9156, which made the instrument satisfactory.

The Chi-squared test, at significance level of 0.05, was used to observe the similarities between the groups with respect to gender, age range, and schooling. For data analysis, the mean scores of the responses to the items of Questionnaires A and B were calculated in both groups of the study. To compare the mean scores of Questionnaires A and B between the groups, dependence between the mean scores of the questions was also analyzed considering the two paired groups and the categorical variables: gender and schooling, for the answers in the Questionnaires A and B. Thus it was analyzed whether the responses to Questionnaires A and B by groups were influenced by gender and schooling. The Non-parametric Mann-Whitney U Test was applied considering a significance level of 5% (p<0.05).

RESULTS

Table 1 presents the characteristics and compares the individuals in the Study (SG) and Control (CG) Groups according to the demographic variables.

Most of the workers in both groups were women. Mean age was 38.6 years (SD=7.62) in the SG and 41.3 years (SD=9.41) in the CG, with predominance of individuals aged 31-50 years. High School was the predominant educational

level in both groups. No statistically significant differences were observed between the groups regarding gender, age range, and schooling.

In the SG, the scores on the items about knowledge and behavior regarding occupational hearing health increased in 35 questions after the educational workshops, and 26 (72.22%) questions presented significant difference in relation to the Questionnaire (Wilcoxon test at significance level of 0.05). In the CG, the scores improved in six (19.44%) questions in the comparison between Questionnaires A and B.

Table 2 shows the comparison of the mean scores of answers given in Questionnaires A and B between the groups.

Table 1. Characterization of the Control (CG) and Study (SG) Groups according to gender, age, and schooling (n=80)

Variables	SG n=20		CG n=60		*p*-value*
	n	%	n	%	
Gender					
Female	13	65.00	35	58.33	0.5982
Male	7	35.00	25	41.67	
Age range					
21 to 30 years	4	20.00	11	18.33	
31 to 40 years	8	40.00	15	25.00	0.8892
41 to 50 years	6	30.00	26	43.33	
51 to 60 years	2	10.00	9	15.00	
Education level					
Senior High School	10	50.00	25	41.67	
Incomplete Junior High School	7	35.00	19	31.67	0.5630
Junior High School (9 years)	3	15.00	16	26.67	

*Chi-squared test at significance level of 0.05

Table 2. Comparison of the mean scores of answers between the Control (CG) and Study (SG) Groups in the A and B questionnaires (n=80)

Questions	Questionnaire A			Questionnaire B		
	SG n=20	CG n=60	***p*-value**	SG n=20	CG n=60	*p*-value
1	3.80	4.25	0.3340	5.00	4.37	0.0408*
2	4.80	4.93	0.4112	5.00	4.93	0.5637
3	3.65	2.97	0.1317	5.00	3.08	0.0000*
4	3.35	3.40	0.9805	5.00	4.37	0.0186*
5	2.80	3.15	0.4623	4.80	2.88	0.0001*
6	3.50	3.30	0.7134	5.00	4.02	0.0034*
7	2.85	3.22	0.4281	5.00	3.70	0.0003*
8	3.60	4.08	0.3684	5.00	4.13	0.0238*
9	2.40	2.87	0.3654	5.00	3.30	0.0003*
10	4.60	4.27	0.3846	5.00	4.45	0.0679
11	4.80	4.87	0.7356	5.00	5.00	1.0000
12	2.50	2.90	0.4379	5.00	2.00	0.0000
13	4.40	3.33	0.0314*	5.00	3.97	0.0045*
14	3.30	3.22	0.9235	4.60	1.20	0.0000*
15	2.40	3.28	0.0621	5.00	4.10	0.0107
16	3.05	3.00	0.9663	4.80	3.83	0.0155*
17	2.75	2.88	0.7914	5.00	2.07	0.0000*
18	2.75	3.50	0.1873	5.00	2.97	0.0001*
19	4.70	4.73	0.8522	5.00	4.30	0.0314*
20	3.55	3.67	0.7831	4.60	1.80	0.0000*
21	4.55	4.20	0.4821	4.40	4.47	0.8522
22	5.00	4.33	0.0524	5.00	4.73	0.2391
23	2.15	2.35	0.5525	4.80	1.52	0.0000*
24	2.45	2.10	0.5421	5.00	2.98	0.0000*
25	4.80	4.53	0.5525	5.00	3.97	0.0000*
26	2.60	3.28	0.1840	5.00	3.60	0.0022*
27	3.40	2.83	0.2612	5.00	3.73	0.0032*
28	1.70	2.08	0.5856	5.00	2.52	0.0000*
29	1.80	2.08	0.4766	5.00	2.58	0.0000*
30	4.15	4.53	0.3392	5.00	4.35	0.0315*
31	2.05	1.93	0.9571	5.00	1.75	0.0000*
32	3.70	4.17	0.2516	5.00	3.55	0.0008*
33	1.60	2.27	0.1508	1.80	2.07	0.5535
34	1.80	2.13	0.4660	5.00	2.53	0.0000*
35	1.00	1.00	1.0000	5.00	1.00	0.0000*
36	1.00	1.00	1.0000	5.00	1.00	0.0000*

*Mann-Whitney U test at 5% significance level ($p<0.05$)

In Questionnaire A, before the Educational Intervention, statistically significant difference was observed between the SG and the CG only for question 13 ("I can not protect my hearing in noisy environments unless I wear hearing protectors").

In Questionnaire B, after the Educational Intervention, statistically significant difference was found between the groups in 30 (83.33%) questions, with the SG presenting higher scores (>4 - considered as positive/adequate perception) in 29 (80.56%) of these questions. It was also observed that, of the 36 questions in Questionnaire A, individuals in the SG did not reach the expected minimum score (3 points) in (16) 44.44% of them, whereas individuals in the CG did not do it in (15) 41.66% of them.

Table 3 shows the comparison between groups of the mean scores in Questionnaires A and B according to gender.

In Questionnaire A, differences between the genders were observed in five (13.88%) and six (16.66%) questions for the SG and CG, respectively. The following themes presented differences between the genders: Use conditions of hearing protection devices (HPD) (questions 5, 6, 7, and 14), Self-efficacy in the use of HPDs (question 18), Knowledge about hearing diagnosis (question 34), and Knowledge about actions of the Hearing Preservation Program (HPP)

Table 3. Association between the answers to the A and B Questionnaires for the Control (CG) and Study (SG) Groups stratified by gender (n=80)

Q	SG (n=20)						CG (n=60)					
	Questionnaire A			Questionnaire B			Questionnaire A			Questionnaire B		
	Female	Male	*p*	Female	Male	*p*	Female	Male	*p*	Female	Male	*p*
	n=13	n=7		n=13	n=7		n=35	n=25		n=35	n=25	
1	3.46	4.43	0.4054	5.00	5.00	1.000	4.09	4.48	0.6155	4.09	4.48	0.6155
2	4.69	5.00	0.8121	5.00	5.00	1.000	4.89	5.00	0.8572	4.89	5.00	0.8572
3	3.77	3.43	0.8121	5.00	5.00	1.000	2.51	3.60	*0.0326	2.51	3.60	*0.0326
4	3.15	3.71	0.7513	5.00	5.00	1.000	3.09	3.84	0.2332	4.20	4.60	0.3969
5	2.15	4.00	*0.0476	5.00	4.43	0.6345	2.63	3.88	*0.0320	2.63	3.88	*0.0320
6	2.69	5.00	*0.0293	5.00	5.00	0.9684	2.97	3.76	0.0833	2.97	3.76	0.0833
7	2.08	4.29	*0.0394	5.00	5.00	0.9684	2.54	4.16	*0.0036	3.49	4.00	0.1280
8	3.15	4.43	0.2673	5.00	5.00	0.9684	2.94	3.08	0.8279	2.94	3.08	0.8279
9	2.85	5.00	0.0572	5.00	5.00	0.9684	3.66	4.68	*0.0422	3.66	4.68	*0.0422
10	2.23	2.71	0.6919	5.00	5.00	0.9684	2.83	2.92	0.8867	3.00	3.72	0.1820
11	4.38	5.00	0.6065	5.00	5.00	0.9684	4.31	4.20	0.8572	4.17	4.84	0.2217
12	4.69	5.00	0.8121	5.00	5.00	0.9684	4.77	5.00	0.7134	5.00	5.00	0.9940
13	1.77	3.86	0.0572	5.00	5.00	0.9684	2.57	3.36	0.1565	1.57	2.60	0.0931
14	4.69	3.86	0.4757	5.00	5.00	0.9684	3.86	2.60	*0.0400	3.86	2.60	*0.0400
15	2.92	4.00	0.2193	4.69	4.43	0.8430	3.03	3.48	0.3335	1.11	1.32	0.7415
16	1.92	3.29	0.2193	5.00	5.00	0.9684	3.14	3.48	0.4268	3.69	4.68	*0.0437
17	2.38	4.29	0.0813	4.69	5.00	0.8121	2.80	3.28	0.3224	3.57	4.20	0.1921
18	1.54	5.00	*0.0010	5.00	5.00	0.9684	2.11	3.96	*0.0020	1.23	3.24	*0.0010
19	2.15	3.86	0.1223	5.00	5.00	0.9684	3.23	3.88	0.0794	3.23	3.88	0.0794
20	4.54	5.00	0.4281	5.00	5.00	0.9684	4.77	4.68	0.7700	3.91	4.84	0.0756
21	3.15	4.29	0.2847	4.38	5.00	0.6065	3.66	3.68	0.9224	1.69	1.96	0.6583
22	4.31	5.00	0.4281	4.08	5.00	0.4281	4.09	4.36	0.7643	4.54	4.36	0.7700
23	5.00	5.00	0.9684	5.00	5.00	0.9684	4.09	4.68	0.3335	4.66	4.84	0.7700
24	2.46	1.57	0.4281	4.69	5.00	0.8121	2.31	2.40	0.7529	1.54	1.48	0.6528
25	2.46	2.43	0.9684	5.00	5.00	0.9684	2.34	1.76	0.4998	2.34	1.76	0.4998
26	4.69	5.00	0.8121	5.00	5.00	0.9684	4.34	4.80	0.4268	3.80	4.20	0.5046
27	2.23	3.29	0.3621	5.00	5.00	0.9684	3.40	3.12	0.7134	3.74	3.40	0.5790
28	3.46	3.29	0.8121	5.00	5.00	0.9684	3.17	2.36	0.1632	3.66	3.84	0.8572
29	1.69	1.71	0.9054	5.00	5.00	0.9684	2.09	2.08	0.9821	2.69	2.28	0.3683
30	1.92	1.57	0.7815	5.00	5.00	0.9684	2.03	2.16	0.8927	2.57	2.60	0.8867
31	3.69	5.00	0.1779	5.00	5.00	0.9684	4.51	4.56	0.9283	4.57	4.04	0.5638
32	2.00	2.14	0.9684	5.00	5.00	0.9684	1.86	2.04	0.9581	1.94	1.48	0.3845
33	3.69	3.71	0.9684	5.00	5.00	0.9684	4.29	4.00	0.7815	4.00	2.92	0.1022
34	1.00	2.71	0.1322	1.31	2.71	0.2193	1.80	2.92	0.0674	1.46	2.92	*0.0168
35	1.00	3.29	*0.0433	5.00	5.00	0.9684	1.80	2.60	0.1921	2.26	2.92	0.2803
36	1.00	1.00	0.9684	5.00	5.00	0.9684	1.00	1.00	0.9940	1.00	1.00	0.9940

*Mann-Whitney U test at 5% significance level ($p<0.05$). Captions: Q = question

(question 35). The women scored below the expected (<3) in these questions, and lower than the men did. As for Questionnaire B, no statistically significant differences were found between the genders in the SG and an increase in score was observed between the women; the CG remained with differences between the genders.

Table 4 presents the comparison between groups of the mean scores in Questionnaires A and B according to schooling stratified by Junior-High School (incomplete and complete) and High School.

Regarding schooling, in Questionnaire A, only one question presented significant difference in the SG (no. 17), whereas in Questionnaire B only one question showed significant difference in the CG (no. 25), with workers with Junior-High School assigning lower scores than those with High School, and <3 (negative/ inadequate perception) for both questions.

Table 4. Association between the answers to the A and B Questionnaires for the Control (CG) and Study (SG) Groups stratified by schooling (n=80)

Q	SG (n=20)						CG (n=60)					
	Questionnaire A			Questionnaire B			Questionnaire A			Questionnaire B		
	JHS n=10	HS n=10	*p*	JHS n=10	HS n=10	*p*	JHS n=35	HS n=25	*p*	JHS n=35	HS n=25	*p*
1	3.80	3.80	10.000	5.00	5.00	10.000	3.94	4.68	0.1845	4.26	4.52	0.5094
2	4.60	5.00	0.7337	5.00	5.00	10.000	4.89	5.00	0.8572	4.89	5.00	0.8572
3	3.80	3.50	0.8206	5.00	5.00	10.000	3.23	2.60	0.3187	3.29	2.80	0.2189
4	3.80	2.90	0.3258	5.00	5.00	10.000	3.37	3.44	0.7134	4.17	4.64	0.2161
5	2.90	2.70	10.000	4.60	5.00	0.7337	3.23	3.04	0.6474	2.86	2.92	0.9402
6	3.00	4.00	0.3643	5.00	5.00	0.9699	2.89	3.88	0.0559	3.91	4.16	0.5688
7	2.20	3.50	0.2123	5.00	5.00	0.9699	3.26	3.16	0.8986	3.74	3.64	0.9522
8	3.80	3.40	0.7337	5.00	5.00	0.9699	2.83	3.24	0.5046	2.91	2.56	0.5437
9	3.40	3.80	0.7337	5.00	5.00	0.9699	3.91	4.32	0.4224	4.20	4.04	0.7988
10	2.60	2.20	0.7337	5.00	5.00	0.9699	3.29	2.28	0.1006	3.26	3.36	0.8867
11	4.20	5.00	0.4727	5.00	5.00	0.9699	4.09	4.52	0.4810	4.40	4.52	0.7586
12	5.00	4.60	0.7337	5.00	5.00	0.9699	4.89	4.84	0.9462	5.00	5.00	0.9940
13	2.00	3.00	0.3643	5.00	5.00	0.9699	2.77	3.08	0.5289	2.26	1.64	0.3151
14	4.60	4.20	0.7337	5.00	5.00	0.9699	3.51	3.08	0.4810	4.00	3.92	0.9581
15	2.90	3.70	0.3447	4.60	4.60	0.9699	3.17	3.28	0.8631	1.23	1.16	0.9164
16	1.60	3.20	0.1041	5.00	5.00	0.9699	3.20	3.40	0.8690	4.03	4.20	0.7586
17	2.10	4.00	***0.0452**	4.60	5.00	0.7337	3.17	2.76	0.3487	3.91	3.72	0.7415
18	2.20	3.30	0.3258	5.00	5.00	0.9699	3.09	2.60	0.4810	2.26	1.80	0.4580
19	2.40	3.10	0.4497	5.00	5.00	0.9699	3.29	3.80	0.2362	3.06	2.84	0.8220
20	4.60	4.80	0.7337	5.00	5.00	0.9699	4.71	4.76	0.8867	4.29	4.32	0.9940
21	3.50	3.60	0.8501	5.00	4.20	0.4727	3.46	3.96	0.3683	2.03	1.48	0.3723
22	4.50	4.60	0.7624	3.80	5.00	0.2730	4.00	4.48	0.4998	4.31	4.68	0.5537
23	5.00	5.00	0.9699	5.00	5.00	0.9699	4.31	4.36	0.9462	4.66	4.84	0.7700
24	2.20	2.10	0.9397	5.00	4.60	0.7337	2.17	2.60	0.3804	1.51	1.52	0.9581
25	2.80	2.10	0.5454	5.00	5.00	0.9699	1.77	2.56	0.2025	2.49	.68	***0.0255**
26	4.60	5.00	0.7337	5.00	5.00	0.9699	4.51	4.56	0.8927	3.91	4.04	0.8396
27	3.00	2.20	0.4727	5.00	5.00	0.9699	3.34	3.20	0.7643	3.40	3.88	0.4356
28	3.40	3.40	0.9699	5.00	5.00	0.9699	3.23	2.28	0.1417	3.54	4.00	0.5191
29	1.90	1.50	0.7055	5.00	5.00	0.9699	1.97	2.24	0.6528	2.43	2.64	0.7529
30	1.80	1.80	0.9699	5.00	5.00	0.9699	1.97	2.24	0.6966	2.43	2.80	0.5537
31	3.70	4.60	0.2899	5.00	5.00	0.9699	4.63	4.40	0.6966	4.49	4.16	0.6260
32	2.30	1.80	0.5205	5.00	5.00	0.9699	2.06	1.76	0.5387	1.71	1.80	0.9761
33	3.20	4.20	0.1859	5.00	5.00	0.9699	4.03	4.36	0.2974	3.34	3.84	0.3723
34	1.40	1.80	0.7337	1.40	2.20	0.4727	2.14	2.44	0.6314	1.91	2.28	0.5537
35	1.40	2.20	0.4727	5.00	5.00	0.9699	2.03	2.28	0.6856	2.71	2.28	0.4810
36	1.00	1.00	0.9699	5.00	5.00	0.9699	1.00	1.00	0.9940	1.00	1.00	0.9940

*Mann-Whitney test at 5% significance level ($p<0.05$). Captions: JHS = Junior High School; HS = High School

DISCUSSION

The hospital laundry workers investigated were women aged 30-50 years. Predominance of the female gender in the laundry can be explained by the fact that this is a sector presents some characteristics typically considered as women's work activities, such as clothes folding, which require greater attention to details, speed, dexterity, and greater manual skill. Other studies have also reported predominance of women in laundries of health institutions, mainly performing the clothes folding task[10,14].

Regarding schooling, 50% of the individuals in the Study Group (SG) and 41.67% of those in the Control Group (CG) have a High School diploma (Table 1). A similar result was reported in another study conducted in Brazil with laundry workers, in which the authors observed that most of the participants presented High School level[24].

In the evaluation of the Educational Intervention conducted with hospital laundry workers, when comparing the questionnaires between the groups (Table 2), it was possible to observe that, in Questionnaire A – prior to the workshops, only one question (no.13) presented difference between the groups, showing that all workers had similar knowledge, attitudes, and practices. In Questionnaire A, 17 questions in the SG and 14 in the CG presented mean scores considered inadequate (<3), which confirm negative attitudes, behaviors, and knowledge about occupational hearing health. Other authors have corroborated such findings[12,25,26].

The greatest difficulties of the workers verified in Questionnaire A, with mean scores <3 (inappropriate), occurred in the following themes: Intention of preventive behavior (question 17), Self-efficacy of hearing protection use (questions 9 and 12), Habits harmful to hearing (questions 23 and 24), Knowledge about the effects of noise on health and hearing (questions 28, 29, and 31), Knowledge about hearing diagnosis (questions 33 and 34), and Knowledge about actions of the Hearing Preservation Program (HPP) (questions 35 and 36). Other studies that analyzed workers' knowledge regarding prevention of hearing loss corroborate the findings of this research[12,25-27]. For some authors, when noise is not perceived as a harmful environmental factor, little will be done to avoid exposure and its consequences, such as NIHL[6,22,25]. In this sense, in order to modify workers' habits regarding the correct use of hearing protection devices (HPD), educational actions should ensure that they understand both the severity of risk of hearing loss and the benefits of preventive actions[8].

After the workshops, comparison between the responses to Questionnaires A and B showed that 28 (77.77%) questions presented significant differences between the groups, and that individuals in the SG improved their knowledge, attitude, and educational practices. The mean score in the SG after the workshops increased, with 35 (97.22%) questions presenting >4 (adequate perception). Only one question (no. 33: "I am aware of the results of my audiometric examination") maintained a score <3, evidencing lack of knowledge of individuals about the results of their audiometric examinations. It is noteworthy that the vast majority of the workers in the laundry investigated did not undergo routine occupational audiometric assessment (based on the various statements of the workers themselves and on findings in their medical records). The time of audiometry is also important for guidelines that can lead workers to greater awareness of exposure to noise and its prevention, and should be valued and used by speech-language pathologists[6]. However, unless all workers exposed to risk of hearing loss undergo audiometry, this moment of information is hindered. Compliance with legislation regarding the performance of audiometry has not always occurred[3] in spite of its importance, because auditory monitoring is fundamental to assess prevention actions[4].

Other studies have also observed an increase in workers' knowledge about preservation of hearing at work after interventions, but with educational strategies and approaches different from that developed in the present study, evidencing percentage changes smaller than those found here [6-8,11,27,28].

In the USA, a study on educational intervention was conducted with 176 construction workers aiming to increase the use of HPDs. The strategy used was to convey basic information and additional extensive information in four training sessions for one group, and only basic information in a single training session for another group. The authors observed increased (12.1%) use of HPDs and greater content absorption in the group that received basic educational intervention and reinforcement training in four sessions[7]. In Brazil, a study aiming to verify the effectiveness of an educational training intervention, using individual conversation and illustrative material at the time of audiometry, was conducted with 78 workers divided into a research group (44 workers) and a control group (34 workers). The researchers observed that, after the intervention, percentage scores of the study group increased from 50.92% to 64.28% (an increase of 13.36% of correct answers)[28]. In another survey, an intervention was performed in a single training of 30 min, using messages focusing on the positive aspects related to hearing. Participants were 61 workers of both genders divided into intervention group (34 individuals) and control group (27 individuals). Comparison between pre- and post-intervention questionnaires showed significant difference in two of the ten themes addressed for the research group[27].

Comparison between groups regarding the mean scores of the responses to Questionnaire A according to gender (Table 3) showed statistically significant difference in five (13.88%) questions for the SG and in six (16.66%) questions for the CG. The men presented higher scores than the women, and >3, indicating more positive/adequate perception in both groups. Differences between the genders were predominant in the following themes: "Use conditions of hearing protectors" and "Self-efficacy in the use of HPDs", demonstrating that women are less aware of hearing protection. A study conducted in the USA with 1458 workers (1158 men and 300 women) exposed to intense noise in different occupational activities found that women did not wear ear protectors 1.29 times more than men (CI 0.96-1.73; 95%), with 49.3% of women reporting that they did not use an HPD at work against 31.1% of men. The authors justify the non-use of ear protectors, among other factors, by the workers' lack of knowledge about their effectiveness in protecting hearing during exposure to intense noise and the lack of self-efficacy in its use[29]. In an investigation performed in Santa Catarina State, Brazil, on the knowledge of workers about

hearing protection in a meat cold store, the authors observed that the women presented lower level of information compared with that of the men with respect to theme "Perception of susceptibility to acquiring hearing loss" after an educational intervention[27]. A home-based study conducted in Salvador analyzed 299 workers exposed to intense noise and observed use of shell-type ear protectors in 59.3% of the men and 21.4% of the women[30]. Regarding the responses to Questionnaire B in the SG, no difference between the genders was observed after the workshops, evidencing that their contents were adequately assimilated by both genders.

Comparison of the scores in Questionnaire A between the groups according to schooling (Table 4) showed that workers with Junior-High School level present smaller perception of obstacles to prevention action/attenuation of important sounds and prevention action/comfort than those with High School diploma. Educational level is determinant of the effectiveness of an educational program[4]. Nevertheless, a research on the relationship between schooling and workers' knowledge about hearing loss prevention found no association between these variables for workers evaluated prior to the educational intervention[12].

It is possible to observe that the instrument used (Questionnaire A and B) was able to measure the effectiveness of the intervention, which will assist with the planning of future Educational Actions; however, recommendation of this instrument in other studies would depend on determination of its reliability and validity[30]. In the present study, the Cronbach's α test was used to analyze the internal consistency of the questions, and presented a satisfactory result (0.9156).

A limitation to this study is the time interval for assessment of the educational intervention. We suggest that knowledge, attitudes, and practices be re-evaluated in longer intervals, such as after three or six months, to prove the mid-term consolidation of behavioral changes and noise perception.

CONCLUSION

The results show that the Educational Intervention conducted through workshops within a proposal of the Participatory Problem-based Methodology contributed to increase knowledge regarding the occupational hearing health among the participants of the Study Group (SG).

These educational actions were able to bring the participants of the SG to a desired level regarding knowledge, attitude, and prevention practices of Noise-induced Hearing Loss (NIHL).

REFERENCES

1. Cavalcante F, Ferrite S, Meira TC. Exposição ao ruído na indústria de transformação no Brasil. Rev CEFAC. 2013;15(5):1364-70. http://dx.doi.org/10.1590/S1516-18462013005000021.
2. Oliveira RC, Santos JN, Rabelo ATV, Magalhães MDC. The impact of noise exposure on workers in Mobile Support Units. CoDAS. 2015;27(3):215-22. PMid:26222936. http://dx.doi.org/10.1590/2317-1782/20152014136.
3. Gonçalves CGO, Iguti AM. Análise de programas de preservação da audição em quatro indústrias metalúrgicas de Piracicaba. Cad Saude Publica. 2006;22(3):609-18. PMid:16583105. http://dx.doi.org/10.1590/S0102-311X2006000300016.
4. Gonçalves CGO. Saúde do Trabalhador: da estruturação à avaliação de programas de preservação auditiva. São Paulo: Roca; 2009.
5. Gonçalves CGO, Lüders D, Guirado DS, Albizu EJ, Marques JM. A percepção sobre protetores auriculares por trabalhadores participantes de programas de preservação auditiva: estudo preliminar. CoDAS. 2015;27(4):309-18. PMid:26398252.
6. Trabeau M, Neitzel R, Meischke H, Daniell WE, Seixas NS. A comparison of "train-the-trainer" and expert training modalities for hearing protection use in construction. Am J Ind Med. 2008;51(2):130-7. PMid:18067179. http://dx.doi.org/10.1002/ajim.20499.
7. Seixas NS, Neitzel R, Stover B, Sheppard L, Daniell B, Edelson J, et al. A multi-component intervention to promote hearing protector use among construction workers. Int J Audiol. 2011;50(Suppl 1):46-56. PMid:21091403. http://dx.doi.org/10.3109/14992027.2010.525754.
8. Stephenson MR, Shaw PB, Stephenson CM, Graydon PS. Hearing loss prevention for carpenters: part 2 – demonstration projects using individualized and group training. Noise Health. 2011;13(51):122-31. PMid:21368437. http://dx.doi.org/10.4103/1463-1741.77213.
9. Lizuka LY, Gil D. Audiological evaluation in employees exposed to noise in a public hospital. Rev CEFAC. 2014;16(3):715-22.
10. Fontoura FP, Gonçalves CGO, Soares VMN. Hospital laundry working and environment conditions: workers' perception. Rev Bras Saúde Ocupacional. 2016;41(5):1-11.
11. Hong O, Eakin BL, Chin DL, Feld J, Vogel S. An internet-based tailored hearing protection intervention for firefighters: development process and users' feedback. Health Promot Pract. 2013;14(4):572-9. PMid:23149759. http://dx.doi.org/10.1177/1524839912462031.
12. 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. http://dx.doi.org/10.1590/1982-021620146112.
13. 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. http://dx.doi.org/10.1590/1982-0216201414012.
14. Melaré FA. Alterações auditivas ocupacionais em uma lavanderia: uma proposta de ação. Saúde em Revista. 2005; 7(15):21-26.
15. Silva MC, Luz VB, Gil D. Ruído em hospital universitário: impacto na qualidade de vida. Audiol. Commun. Res. 2013;18(2):109-19. http://dx.doi.org/10.1590/S2317-64312013000200009.
16. Freire P. Educação e mudança. Rio de Janeiro: Paz e Terra; 1990.
17. Nogueira IS, Vergaças HM, Santos LF, Cypriano PE, Moreno MG, Lima SO, et al. A prática educativa na estratégia saúde da família: estratégia para repensar e reconstruir ações dialógicas. Arq Ciênc Saúde UNIPAR. 2015;19(1):11-7.
18. Vila ACD, Vila VSC. Tendências da produção do conhecimento na educação em saúde no Brasil. Rev Lat Am Enfermagem. 2007;15(6):1177-83. PMid:18235962. http://dx.doi.org/10.1590/S0104-11692007000600019.
19. Vasconcellos LCF, Almeida CVB, Guedes DT. Vigilância em saúde do trabalhador: passos para uma pedagogia. Trab Educ Saúde. 2010;7(3):445-62. http://dx.doi.org/10.1590/S1981-77462009000300004.
20. NIOSH: National Institute for Occupational Safety and Health. Preventing occupational hearing loss: a practical guide. Cincinnati: NIOSH; 1996. (DHHS Publication; 96-110).
21. Bramatti L, Morata TC, Marques JM, Martini UG. Versão e adaptação para o português brasileiro do questionário: Crenças e atitudes sobre prevenção de perda auditiva. Rev. CEFAC. 2012;14(1):65-78. http://dx.doi.org/10.1590/S1516-18462011005000082.
22. Bettega AS. Avaliação da eficácia do programa de prevenção de perda auditiva em uma indústria brasileira [dissertação]. Curitiba: Programa de Mestrado em Distúrbios da Comunicação, Universidade Tuiuti do Paraná; 2010.
23. Santana MM, Silva CC, Monteiro CS, Mafra SCT, Silva VE. Avaliação de uma unidade de processamento de roupas de serviços de saúde a partir da Análise Ergonômica do Trabalho: um estudo de caso em Viçosa - Minas

Gerais. In: V Workshop de Análise Ergonômica de trabalho e II Encontro Mineiro de Estudos de Ergonômia; 2011; Viçosa. Anais. Viçosa: ERGOPLAN; 2011. p. 1-24.

24. Svensson EB, Morata TC, Nylén P, Krieg EF, Johnson AC. Beliefs and attitudes among Swedish workers regarding the risk of hearing loss. Int J Audiol. 2004;43(10):585-93. PMid:15724523. http://dx.doi.org/10.1080/14992020400050075.

25. Luz TS, Borja ALVF. Sintomas auditivos em usuários de estéreos pessoais. Int Arch Otorhinolaryngol. 2012;16(2):163-9. PMid:25991931.

26. Bramatti L, Morata TC, Marques JM. Ações educativas com enfoque positivo em programa de conservação auditiva e sua avaliação. Rev CEFAC. 2008;10(3):398-408. http://dx.doi.org/10.1590/S1516-18462008000300016.

27. Rocha CH, Santos LHD, Moreira RR, Neves-Lobo IF, Samelli AG. Verificação da efetividade de uma ação educativa sobre proteção auditiva para trabalhadores expostos a ruído. J Soc Bras Fonoaudiol. 2011;23(1):38-42. PMid:21552731. http://dx.doi.org/10.1590/S2179-64912011000100010.

28. Tak S, Davis RR, Calvert GM. Exposure to hazardous workplace noise and use of hearing protection devices among US workers—NHANES, 1999–2004. Am J Ind Med. 2009;52(5):358-71. PMid:19267354. http://dx.doi.org/10.1002/ajim.20690.

29. Meira TC, Santana VS, Ferrite S. Gender and other factors associated with the use of hearing protection devices at work. Rev Saude Publica. 2015;49(0):76. PMid:26487294. http://dx.doi.org/10.1590/S0034-8910.2015049005708.

30. Stone DH. Design a questionnaire. BMJ. 1993;307(6914):1264-6. PMid:8281062. http://dx.doi.org/10.1136/bmj.307.6914.1264.

Author contributions

FPF was responsible for the study design, data collection, analysis and interpretation of the results, and writing of the manuscript; CGOG was in charge of the study design, data analysis, and revision of the manuscript; MHW and DL contributed to the study design and revision of the manuscript.

Annex 1. Knowledge and Attitudes about Hearing Preservation at Work

QUESTIONNAIRE A **Read the statements and check the alternative that indicates your opinion according to the following criterion: 1-fully agree; 2-agree; 3-neither agree nor disagree; 4-disagree; 5-strongly disagree.**					
	1	2	3	4	5
1) I believe I can work close to loud noise without damaging my hearing.					
2) If I lost part of my hearing, it would be more difficult for people to talk to me.					
3) I cannot always say when I need a hearing protection device (HPD).					
4) I am convinced that I can prevent hearing loss by wearing an HPD.					
5) Shell-type ear protectors are very hot and heavy to be used at work.					
6) It is difficult to hear beeps or other warning signs if I am wearing an HPD.					
7) I cannot wear an HPD because I need to hear people talking to me while I am working.					
8) I do not intend to wear an HPD when I am near machines or noisy equipment.					
9) I believe I know how to put on and wear HPDs.					
10) I believe that exposure to loud noise can impair my hearing.					
11) I do not believe that losing part of my hearing because I worked in a noisy environment would be a great disadvantage.					
12) I know when a semi-insert HPD (plug-type) needs to be replaced.					
13) I can not protect my hearing in noisy environments unless I wear hearing protectors.					
14) Shell-type ear protectors are not comfortable because they make a lot of pressure on the ears.					
15) Using HPDs does not prevent me from hearing important sounds made by tools or machines.					
16) I can understand people's speech well enough to do my job while I am wearing an HPD.					
17) I usually wear hearing protection whenever I am working near loud noise or noisy equipment.					
18) If my co-workers asked me, I could show them the correct way to adjust and wear an HPD.					
19) If I really want to preserve my hearing, it is important that I wear hearing protection every time I am near loud noise.					
20) Plug-type HPDs can be comfortable if properly adjusted.					
21) Even in quiet environments, sometimes it is difficult to hear when people are talking to me.					
22) If I had an HPD with me, I would use it every time I was near noise that was loud enough to hurt my hearing.					
23) I believe smoking can harm my hearing even more.					
24) The use of cotton swabs is the best way to sanitize my ears.					
25) I believe that listening to loud music does not demage hearing.					
26) I know that hearing loss causes buzzing in the ears.					
27) I am not aware whether hearing loss is irreversible.					
28) I believe that exposure to loud noise can cause increased blood pressure.					
29) I believe exposure to loud noise can cause a change in heart rate.					
30) Exposure to loud noise can cause headaches.					
31) I do not believe that exposure to loud noise can cause stress.					
32) I am aware that exposure to loud noise can cause low concentration and irritability.					
33) I am aware of the results of my audiometric examination.					
34) I am concerned about following the results of my audiometric examinations periodically.					
35) I do not know the objectives of the Hearing Preservation Program (HPP).					
36) I receive information about the effects of noise on health and hearing during PPA training.					

Annex 1. Continued...

QUESTIONNAIRE B					
Read the statements and check the alternative that indicates your opinion according to the following criteria: 1-fully agree; 2-agree; 3-neither agree nor disagree; 4-disagree; 5-strongly disagree.					
	1	2	3	4	5
1) I do not believe I should wear a hearing protection device (HPD) whenever I am working in loud environments.					
2) If I lost part of my hearing, it would not be more difficult for people to talk to me.					
3) I know when to wear HPDs.					
4) If I wear an HPD I will protect my hearing from loud noise.					
5) Shell-type ear protectors are uncomfortable to use even when well adusted.					
6) Even when I am wearing an HPD I can still hear the beeps/whistles or other warning signs.					
7) I can still hear what people say while I am working, even when I am wearing hearing an HPD.					
8) I intend to wear an HPD when I am near machines or noisy equipment.					
9) I am not sure I know how to put on and wear HPDs.					
10) If I do not protect my ears, the loud noise can hurt my hearing.					
11) It would not be upset if I lost part of my hearing because I worked in a noisy environment.					
12) I do not know when a semi-insert HPD (plug-type) needs to be replaced.					
13) I would not lose my hearing if I used hearing protectors in noisy environments.					
14) It is possible to find shell-type ear protectors that are not too hot or heavy to wear.					
15) Using HPDs prevents me from hearing important sounds made by tools or machines.					
16) I cannot understand people's speech well enough to do my job while I am wearing an HPD.					
17) I do not usually wear hearing protection whenever I am working near loud noise or noisy equipment.					
18) If my co-workers asked me, I would not be able to show them the correct way to adjust and wear an HPD.					
19) If I really want to preserve my hearing, it is important that I wear hearing protection every time I am near loud noise.					
20) If I need plug-type hearing protectors, I can get one that can be adjusted not to make a lot of pressure or cause discomfort.					
21) Even in quiet environments, sometimes it is difficult to hear people speaking.					
22) Even if I had an HPD with me, I would not use it every time I was near noise that was loud enough to hurt my hearing.					
23) I do not believe smoking can harm my hearing even more.					
24) The use of cotton swabs is the best way to sanitize my ears.					
25) I believe that listening to loud music does not demage hearing.					
26) I know that hearing loss causes buzzing in the ears.					
27) I am not aware whether hearing loss is irreversible.					
28) I believe that exposure to loud noise can cause increased blood pressure.					
29) I believe exposure to loud noise can cause a change in heart rate.					
30) Exposure to loud noise can cause headaches.					
31) I do not believe that exposure to loud noise can cause stress.					
32) I am aware that exposure to loud noise can cause low concentration and irritability.					
33) I am not aware of the results of my audiometric examination.					
34) I am concerned about following the results of my audiometric examinations periodically.					
35) I do not know the objectives of the Hearing Preservation Program (HPP).					
36) I receive information about the effects of noise on health and hearing during PPA training.					