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Original articles

Logical operating model of the hearing conservation program for workers

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ABSTRACT

Purpose: to validate the contents of an operating model of hearing conservation programs.

Methods: this is a documentary and methodological research, in which the operating model was evaluated by ten experts in audiology, through the analysis of the activities developed in the implementation of the hearing conservation program. The components were analyzed according to the formula that determines the content validation index by item, and the operational logical model as a whole, according to the content validation formula by scale level. The items were considered valid when agreement among participants reached more than 80%.

Results: the operating model was structured in 4 (four) dimensions, namely: (1) Management; (2) Environmental Control; (3) Attention to Hearing Health; (4) Evaluation of Efficacy and Efficiency. Each dimension corresponds to a set of activities (referred to as processes), and their respective results expected. For the structure of the program, considering its set of dimensions, material, organizational and human resources were listed.

Conclusion: the proposed operating model and its components proved to be valid in their relevance and comprehensibility, offering support and applicability in evaluating the effectiveness and efficiency of the program.

Keywords: Validation Studies; Program Evaluation; Noise-induced Hearing Loss

INTRODUCTION

The need for evaluation arises from the perception that a program is a set of complex processes addressing specific objectives, and that generate determined results. Hence, the evaluation process is a means of identifying, analyzing and judging the components of a program. The importance of the evaluation is in the measuring of events that communicate the results coming from implementing the program, which not only makes evident the successes and failures, but also identifies, describes and monitors the actions. This approach favors the present concept of programs, in addition to offering resources that will lead to solutions that improve the quality and efficiency of the actions[1,2].

In the perspective of the health assessment, the evaluation consists of understanding and describing the program or the health service, creating a valuation analysis based on the components involved, whereas the audit's objective is to analyze the program's or health service's compliance to the current norms. Both the audit and the evaluation are approaches that furnish tools for management in the field of health, increasing the potentials of its results[3].

The Noise is a type of sound harmful to the auditory system, which impacts, both directly and indirectly, other systems of the human body. In the occupational context, the exposure to an average of 85 dB (A) for eight hours a day becomes a risk factor for the emergence of Occupational Noise-Induced Hearing Loss (NIHL). NIHL is a progressive and irreversible highly prevalent occupational illness, which, with time, worsens in proportion to the exposure to noise. However, it's preventable[4-6].

The Hearing Conservation Program (HCP) consists of a set of continuous, dynamic, systematic, intrasectoral activities, performed by means of scanning and diagnostic actions, intended to avoid the triggering or worsening of Occupational NIHL, thus minimizing the risks to the workers' health, which varies according to contextual and structural particularities of each company. In order to assess the efficacy and efficiency of this program, the following actions should be considered (as recommended by the Brazilian Social Security's Service Order number 608 - OS 608): a) Monitoring of the exposure to high sound pressure levels; b) Engineering and administrative control; c) Audiometric monitoring; d) Indication of Personal Protective Equipment; e) Instruction and motivation; f) Keeping records; and, g) Evaluation of the efficacy and efficiency of the program[7].

In compliance with the guidelines of the Brazilian National Committee for Noise and Hearing Conservation (CNRCA, as abbreviated in Portuguese), the OS 608 recommends that the evaluation of an HCP should happen systematically and periodically, and should consider the following procedures: a) evaluation of perfection and quality of the program's components; b) evaluation of the audiologic assessment's data; and, c) evaluation of the workers' opinion. Furthermore, the Environmental Risk Prevention Program (abbreviated in Portuguese as PPRA) advocates that the companies are obligated to conduct, whenever necessary, and at least once a year, an overall analysis of the program in order to evaluate its development and carry out appropriate adjustments, in addition to establishing new goals and priorities[7].

Evaluation of the HCP efficacy has been commonly conducted using the checklist proposed by the National Institute for Occupational Safety and Health (NIOSH)[8]. Although it contains items necessary for an audit, such checklist is not a tool for the overall evaluation of the program. In Brazil, a protocol for auditing HCP was developed as a result of Saldanha Junior's study[9]. However, there isn't yet any evaluation instrument built upon the methodological basis of the evaluation research, by means of the development of an operating model.

Operating models are useful as references for evaluation. Developing the logical design of a program implies in scanning it, in regard to what constitutes its components and how it functions, through the description of the manifold program's components, considering the variables to be observed, measured and evaluated, pointing to hypotheses about the relations between the activities performed, its results and external variables that interfere in these relations, outlining the limitations or weaknesses of its presuppositions, and making it possible to identify where better evidences should be sought[10,11].

Hence, describing the theory of how an intervention takes place may increase the evaluation's capacity to estimate the impact of a program, which is an important stage for the evaluation's planning, considering not only the expected final results, but also the processes, the means and the conditioning factors. This understanding must be looked for in literature and in the experts' opinion, in which the collective appraisal strengthens the implementation and the learning of

those involved, broadening the spread of knowledge and discussions regarding the program, in addition to reinforcing the internal validity of the operating model[12,13].

In the consulted literature, there wasn't found any operating model of an HCP in light of the Brazilian legislation, grounded on theoretical models and validated by scientific methods.

Therefore, the research aims at validating the content of an operating model of hearing conservation programs. It is presumed that the development of an operating model of an HCP may contribute to defining patterns for monitoring the processes involved, thus, being useful to help professionals and managers in planning, executing and evaluating the program.

METHODS

This article is a documentary and methodological research, with the purpose of developing an operating model (OM) of an HCP's performance. The study was approved by the Research Ethics Committee of the Federal University of Pernambuco, under the report number 1,978,729. The study was carried out through four stages, namely: (1) search and collection of information related to the program; (2) explanation of the problem and basic references; (3) structuring of the OM; and, lastly, (4) validation of contents of the processes involved in the HCP. The OM development process was based on two references of program modeling[14,15].

The first stage consisted of a search for documents on the official websites of the following Brazilian institutions: Ministry of Labor and Employment, the National Social Security Institute, and the Jorge Duprat Figueiredo Foundation for Occupational Safety and Medicine (FUNDACENTRO, its Portuguese acronym), from March to November, 2017, in order to provide for the organization of activities and components of the HCP modeling.

The following documents were found and analyzed: Regulatory Norm no. 6 of the Ministry of Labor and Employment (abbreviated in Portuguese as NR 6)[16]; Regulatory Norm no. 7 of the Ministry of Labor and Employment (NR 7)[17];Regulatory Norm no. 9 of the Ministry of Labor and Employment (NR 9)[18];Regulatory Norm no. 15 of the Ministry of Labor and Employment (NR 15)[19]; FUNDACENTRO's Occupational Hygiene Norm 01 (NHO-1)[20]; and, National Social Security Institute's OS 608[9].

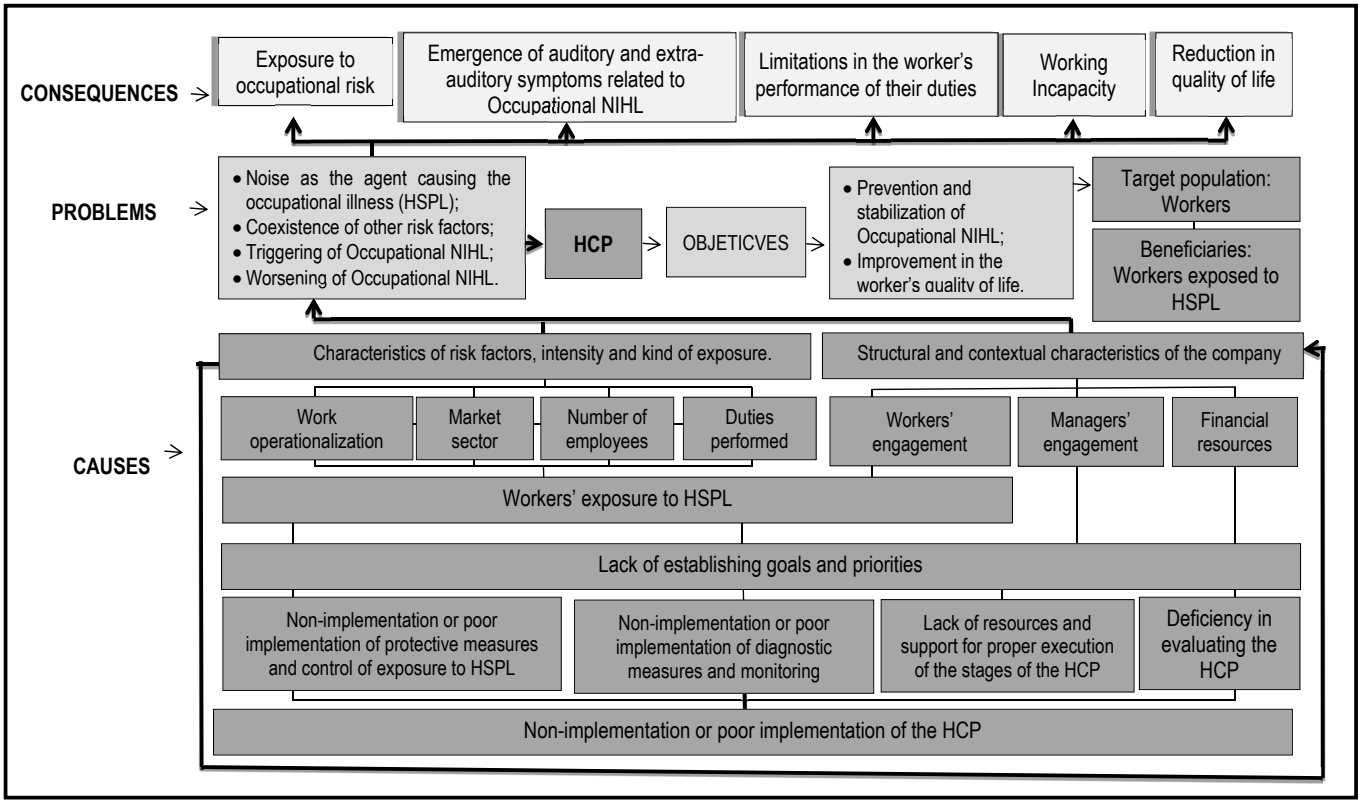
After investigating for documents, the set of key questions meant to guide the outlining of the essential aspects of the program[14] were sought to be answered. The questions were arranged in a chart (Figure 1) based on Guerrero's study[21], in order to synthesize the information, thus contributing to structure the OM of the HCP: 1) What problem generated the need to create and implement the worker's hearing protection program? 2) What health program was created to solve this problem? 3) What's the general purpose of this program? 4) What are the specific objectives of the program? 5) What goals does the program intend to reach? 6) Who is the program's target population? 7) What are the components of this program? 8) What activities are carried out in the program? 9) What structures are necessary for this program to work? 10) What is expected to be produced by carrying out the program's activities? 11) What results does this program expect to achieve? 12) What factors may influence in reaching the expected results, apart from those related to the program?

The second stage aimed at pre-assembling the OM in accordance with the explanations of the problem and the basic references, followed by structuring the program to achieve results and survey the contextual factors which may influence the results[15]. For the construction of the OM, the problem and the descriptors in the initial situation were put in evidence, identifying their main consequences. The causality links are displayed as a problem tree (Figure 2), since this resource enables to clearly show the problems and their interrelations. In order to define the contextual factors, elements related to the political and contingent context were used as a reference, which consider the support given by the participants to the characteristics and objectives related to the intervention and the way in which they interact in a particular distribution of power in the organization[22]. Based on this perspective, it may be presumed that the context interferes both in the degree of implementation and in the effects of an intervention.

KEY QUESTIONS	GUIDING DOCUMENTS FOR THE FUNCTIONING OF THE HCP					
	Regulatory Norm no. 6 (NR-6)	Regulatory Norm no. 7 (NR-7)	Regulatory Norm no. 9 (NR-9)	Regulatory Norm no. 15 (NR-15)	Occupational Hygiene Norm 01 (NHO-1)	Service Order no. 608 of the INSS
1. What problem generated the need to create and implement the worker's hearing protection program?	-	X	X	-	-	-
2. What health program was created to solve this problem?	-	-	X	-	-	X
3. What's the general purpose of this program?	-	-	X	-	-	X
4. What are the specific objectives of the program?	-	-	-	-	-	X
5. What goals does the program intend to reach?	-	-	-	-	-	-
6. Who is the program's target population?	-	X	X	-	-	X
7. What are the components of this program?	-	-	-	-	-	X
8. What activities are carried out in the program?	X	X	X	X	X	X
9. What structures are necessary for this program to work?	X	X	X	-	X	X
10. What is expected to be produced by carrying out the program's activities?	X	X	X	-	X	X
11. What results does this program expect to achieve?	-	-	-	-	-	X
12. What factors may influence in reaching the expected results, apart from those related to the program?	-	X	X	-	-	X

Source: Adapted by the authors based on the study by Guerrero[21].
Key: HCP: Hearing Conservation Program; NR: Regulatory Norm; NHO: Occupational Hygiene Norm; INSS: Brazilian National Social Security Institute.

Figure 1. Guiding documents in structuring the operating model of the hearing conservation program



Key: HCP: Hearing Conservation Program; HSPL: High Sound Pressure Levels; NIHL: Noise-Induced Hearing Loss.

Figure 2. "Problem tree showing the explanation of the problem and the basic references"

The items that composed the OM were collected and organized in a 2010 Microsoft Excel spreadsheet, forming a matrix with elements related to the processes involved in the HCP (Table 1), which were submitted to validation by the participating experts.

Ten speech-language pathologists and audiologists took part in the research, in agreement with Lynn's orientations[23], who suggests at least five and at the most 10 experts participating in the validation process. The sample was selected through consulting their curricula vitae registered on the Lattes Platform of the National Research Council (CNPq, as abbreviated in Portuguese), considering the need for experts specifically qualified to judge the instrument. The following inclusion criteria were established: the expert had to be a speech-language pathologist and audiologist, specialized in audiology, with at least 3 (three) years' experience in developing, implementing and/or managing HCP.

In order to validate the contents of the processes involved in the HCP, referring to the last stage, the experts received through the internet a questionnaire for them to evaluate the elements present in the validating matrix, as well as the instructions to judge each process that will compose the OM of the HCP regarding its relevance, based on the consulted documents and their professional experience. The items were judged according to the adapted 4-point Likert scale[24], each process being evaluated as: (1) irrelevant; (2) little relevant; (3) relevant; and (4) extremely relevant. For each evaluated element, a field was left open for observations and suggestions made by the experts.

In validating the content, the items evaluated by the experts were individually analyzed by applying the formula which determines the item-level content validity index (I-CVI)[23], which corresponds to the: "number of experts who classified the item as relevant and extremely relevant, divided by the total number of experts". The items that were graded "3" or "4" were included, and those graded "1" or "2" were revised or eliminated. For the item to be considered valid, the I-CVI value has to be above 0.78[25].

The validation of the model as a whole was established by the scale-level formula (S-CVI)[23], determined by the "sum of the values of all I-CVI, separately calculated, divided by the number of items considered in the evaluation". The S-CVI must be superior to 0.80 to obtain the scale content validity[26].

RESULTS

In Figure 1, it can be observed that the documents selected for developing the OM answered 11 of the 12 research questions[14]. The answer to question 5, referring to the program's goals, is not mentioned in the selected documents. The answers resulting from these questions enabled the theory of the program to be outlined, making evident the interrelations between the components involved and supporting the development of the OM design.

Once the problem was conceived (key question 1) the need for creating an HCP becomes apparent (key question 2). The activities (key question 8) to be performed in the program, consonant with the components (key question 7) and the necessary structures (key question 9), lead to changes in the problem's situation, making the target population (key question 6) - in this case, the workers included in the HCP - to participate in the preventive and corrective actions. The data obtained in the differential and audiological diagnosis constitute products (key question 10) that reflect the actions' efficacy, having as results (key question 11) avoiding and/or stabilizing the triggering or worsening of Occupational NIHL, which corresponds to the program's general objective (key question 3).

Concerning the factors that may influence the achievement of results (key question 12), the contextual factors, either favorable or not to the functioning of the HCP, are thought of. Understanding such factors is of great importance, since there may be considerable variability in implementing the HCP, depending on the structure and organization of the company.

The chart presented in Figure 2 shows that the triggering and development of the NIHL bring significant auditory and extra-auditory consequences to the worker, causing limitations in the performance of their duties, in addition to incapacitating them for work and reducing their quality of life.The problems lie in the worker's exposure to high noise levels, as well as the coexistence with other risk factors, i.e., elements that contribute to the NIHL triggering or development. Hence, the objectives of the HCP aim to prevent and stabilize the occupational hearing loss and improvement in the quality of life of the worker who is exposed to high sound pressure levels (SPL). Aspects related to the risk factor's characteristics (form, intensity and type of exposure) and the company's characteristics are causes of the problem, and both are influenced by the lack of establishing goals and

priorities evidenced by not implementing or poorly implementing the actions involved in the HCP.

Based on the gathering of documents and the structuring of the problem tree expressed in the above-mentioned diagram, the program was developed as an OM, in order to achieve results.

The OM was structured in 4 (four) dimensions, namely: (1) Management; (2) Environmental Control; (3) Attention to Hearing Health; (4) Evaluation of Efficacy and Efficiency. Each dimension corresponds to a set of processes and their respective expected results. For the structure of the HCP, material, organizational and human resources were listed, taking into account the program's set of dimensions. The impact was considered based on the effects resulting from implementing the HCP as a whole.

The factors that may influence the HCP's results were presented considering aspects deemed as important for a good implementation of the program, according to the documents collected, taking into account aspects related to the political and structural context, namely: (1) support given by the agents to implementing the intervention; (2) relation between the motives underlying the given support and the objectives associated with the program's implementation; (3) control of the organization to operate the HCP and make the intervention effective (establishing priorities and goals); (4) relation between managers of different sectors involved in the HCP; (5) level of specialization of those involved in the HCP; (6) profile of the HCP's manager; (7) attention given to innovation (new actions and approaches); (8) relation of the actions proposed by the HCP with other sectors, commissions or networks which have a direct or indirect relation with the program; (9) planning and evaluation.

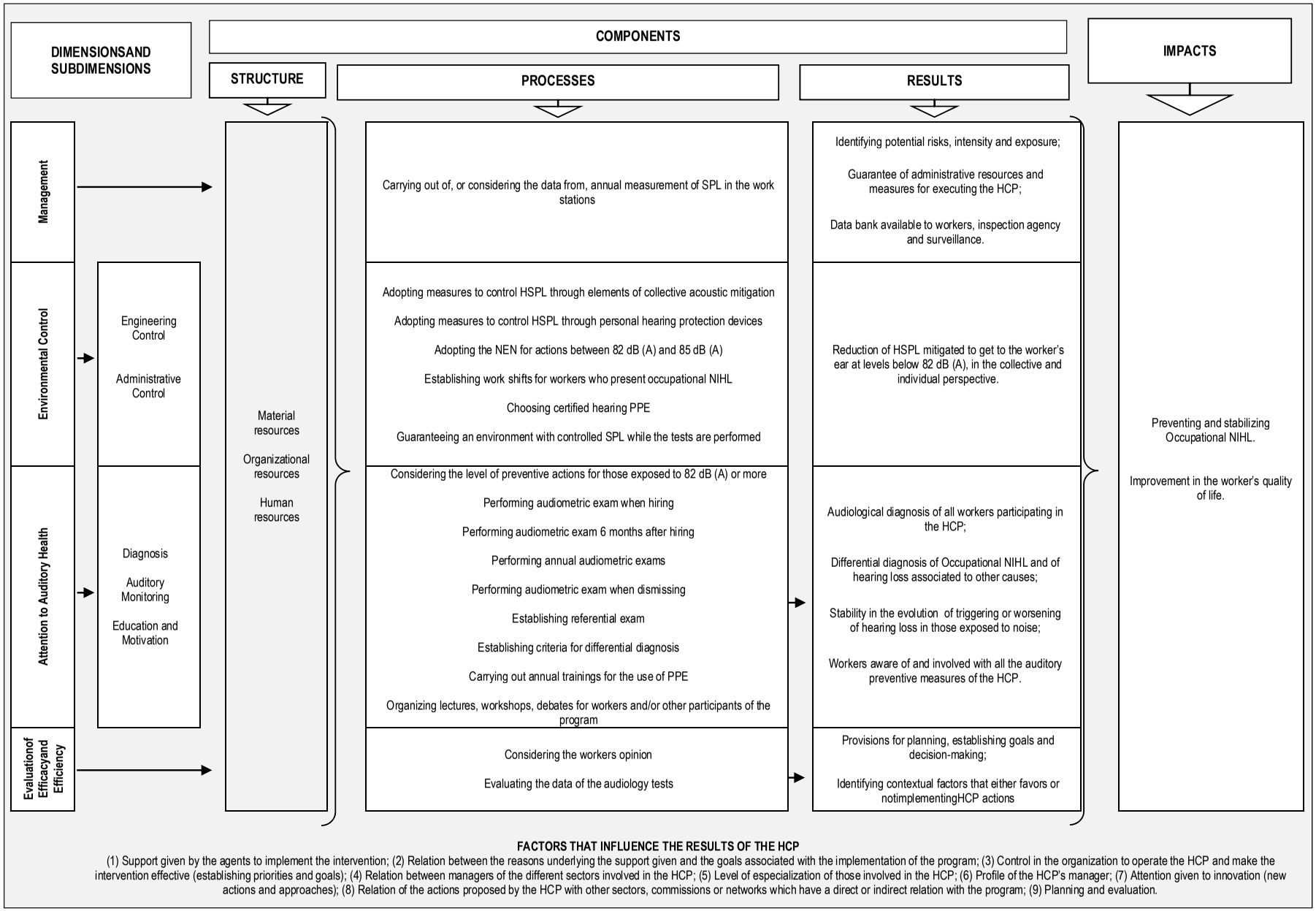
Of all the 19 (nineteen) processes included in the validation matrix of processes involved in the HCP (Table 1), only 1 (one), which refers to the process of performing the test that evaluates the Speech Recognition Percentage Index (SRPI) in the hiring and/or continuing exam, was not considered valid by the experts. As for the index obtained in content validation by scale-level (S-CVI = 0.99) the processes listed in the OM were considered valid as a whole.

After the content validation process, the OM was structured taking into account only the elements evaluated as relevant by the experts, which are presented in Figure 3.

Table 1. Validation matrix of the processes involved in the HCP for developing the operating model, based on the documents' survey

PROCESSES	EXPERTS										NO.	I-CVI
	1	2	3	4	5	6	7	8	9	10	Agreem	
1.1 Carrying out of, or considering the data from, annual measurement of SPL in the work stations	S	S	S	S	S	S	S	S	S	S	10	1
2.1 Adopting measures to control HSPL through elements of collective acoustic mitigation	S	S	S	S	S	S	S	S	S	S	10	1
2.2 Adopting measures to control HSPL through personal hearing protection devices	S	S	N	S	S	S	S	N	S	S	8	0.8
2.3 Adoptingthe NEN for actions between 82 dB (A) and 85 dB (A)	S	N	S	S	S	S	S	S	N	S	9	0.9
2.4 Establishing work shifts for workers who present occupational NIHL	S	S	S	S	S	S	S	S	N	S	9	0.9
2.5 Choosing certified hearing PPE	S	S	N	S	S	S	S	S	S	S	9	0.9
2.6 Guaranteeing anenvironment with controlled SPLwhile the tests are performed	S	S	S	S	S	S	S	S	S	S	10	1
3.1 Consideringthe level of preventive actionsfor those exposedto 82 dB (A) or more	S	S	S	S	S	S	S	S	S	S	10	1
3.2 Performing audiometric exam when hiring	S	S	S	S	S	S	S	S	S	S	10	1
3.3 Performing audiometric exam6 months after hiring	S	S	S	S	S	S	S	N	S	S	9	0.9
3.4 Performing annual audiometric exams	S	S	S	S	S	S	S	S	S	S	10	1
3.5 Performing audiometric examwhendismissing	S	S	S	S	S	S	S	S	S	S	10	1
3.6 Performing SRPI both in hiring and continuing exams	S	S	N	S	N	S	S	S	N	S	7	0.7
3.7 Establishing referential exam	S	S	S	S	S	S	S	S	S	S	10	1
3.8 Establishing criteria for differential diagnosis	S	S	N	S	S	S	S	S	S	N	8	0.8
3.9 Carrying out annual trainings for the use of PPE	S	S	S	S	S	S	S	S	S	S	10	1
3.10 Organizing lectures, workshops, debatesfor workers and/orother participants of the program	S	S	S	S	S	S	S	S	S	S	10	1
4.1 Consideringthe workers opinion	S	S	S	S	S	S	S	N	S	S	9	0.9
4.2 Evaluating the data of the audiologytests	N	S	S	S	S	S	S	S	S	S	10	1
S-ICV average											0.99	

Key: HCP: Hearing Conservation Program; SPL: Sound Pressure Levels; HSPL: High Sound Pressure Levels; NEN: Normalized Exposure Level; dB (A): Decibelin the A-weighted scale; NIHL: Noise-Induced Hearing Loss; PPE: Personal Protective Equipment; SRPI: Speech Recognition Percentage Index; No.Agreem: Number of experts in agreement; I-CVI: item-level content validity index; S-CVI: scale-level content validity index; Y: Indicator graded 3 or 4; N: Indicator graded 1 or 2.



Key: HCP: Hearing Conservation Program; SPL: Sound Pressure Level; HSPL: High Sound Pressure Level; NEN: Normalized Exposure Level; dB (A): Decibelin the A-weighted scale; NIHL: Noise-Induced Hearing Loss; PPE: Personal Protective Equipment.

Figure 3. Operating model of the hearing conservation program

DISCUSSION

When considering an HCP, it's extremely important to understand the problem that leads to the need of creating and implementing the program, with the use of the problem tree, which is structured around a central problem and presents its relation with other elements that compose an explanation between different problem levels (central, causes and consequences), which guide effective actions for the changes foreseen by the program[15]. Similarly, getting acquainted with the other domains of the program, oriented by the key questions, enables the theory of the program to be understood, thus backing up the OM's design.

There's a significant distance between the theory (the guidance given) and the practice (that which is done). Authors state that implementing a more rigid legislation in companies may reduce the levels of noise in the work stations[27]. Some health professionals, specifically those of occupational medicine, speech-language pathology and audiology, are acquainted with important elements of the HCP and believe to be developing the program. However, the establishment of actions is limited to minimally complying with the legal obligations in order to avoid or reduce complaints in the labor court[28], which could disarticulate the implementation of the actions.

It's presumed that simply fulfilling the stages of the program doesn't guarantee that it will be effective in preventing NIHL. An effective HCP also depends on the managing of the aspects that involve the program as a whole, taking into account the resources made available by the organization and, above all, the support given by the participants involved in the program.

In the perspective of the relation of the OM with the program's theory, when seeing the program put into effect, it's possible to confront them, tracing a relation between structure, process and results with the changes generated by the intervention, as well as establishing which factors within the context may influence in achieving results[29].

Generally, the processes to be considered in the OM of HCP functioning, which were presented for evaluation, were considered relevant by the experts. The elements that received maximum grades, i.e., (I-CVI>0.80) refer to classic activities performed in the HCP and recommended by the legislation, making evident a contextualized knowledge of the experts concerning the procedures considered to be essential in implementing the program.

In the process that refers to the "carrying out of, or considering the data from, annual measurement of sound pressure levels (SPL) in the work stations", regarded as relevant by the experts (I-CVI = 1.0), it was suggested that this measuring be carried out whenever there are changes/alterations in the work environment, regardless of time lapse, considering also other indicators, such as defining the homogeneous groups of exposure, and criteria for determining the amount of exposure and levels of tolerance.

The process of "adopting measures to control high SPL through elements of collective acoustic mitigation" was considered relevant by experts (I-CVI = 1.0), encompassing suggestions and comments that reinforce the importance of giving priority to adopting these measures in the control hierarchy, followed by implementing administrative and individual measures, respectively, as the OS 608[7], the NR 7[17] and the NR 9[18] advocate.

Regarding the "adoption of measures to control high SPL through personal hearing protection devices", considered relevant as well (I-CVI = 0.8), the experts reiterate that implementing this process only becomes effective and efficient when associated with other collective protection measures, complying with a control hierarchy.

The "adoption of the Normalized Exposure Level (abbreviated in Portuguese as NEN) for actions between 82 dB (A) and 85 dB (A)", as well as the "consideration of preventive actions level for those exposed from 82 dB (A) up", were evaluated as relevant (I-CVI = 0.9 and I-CVI = 1.0, respectively) and conceived as essential indicators of the "root cause of the problem". However, it was suggest by most of the evaluators the adopted value for implementing the actions be of 85 dB (A), with dose of 0.5 (dose superior to 50%), which is equivalent to 80 dB (A), in consonance with the recommendations present in the NR 9[18] and with the orientations of the Manual of guidelines and minimum parameters for developing and managing the HCP[30], published by the FUNDACENTRO. In its turn, the NHO-1 recommends the NEN of 82 dB (A), for the purpose of comparing with the limit of exposure and adopts duplication increments of smaller doses (q = 3)[20]. The evaluators' suggestions and comments make evident that adopted action level criterion for environmental control of those exposed to high SPL depends on how the manager of the program interprets the legislation, and what degree of strictness was adopted for implementing actions.

Only one of the processes presented for validation, referring to "performing SRPI hiring and/or continuing exam", was not considered relevant (I-CVI = 0.78). Nevertheless, speech audiometry becomes valid when alterations in the ability to recognize speech due to exposure to noise is taken into account. The intelligibility of speech, especially when competing with noise, becomes impaired, because it both alters and distorts the audibility of sounds.

Authors reinforce that the recognition of speech in individuals with auditory threshold within normality, yet exposed to noise, present lower performance in this skill, when compared to a control group without such exposure, which reinforces the importance of this type of evaluation[31,32].

Based on scientific evidence, it was observed that the results of the speech audiometries of workers exposed to a mixture of aromatic and aliphatic solvents presented low percentage in the SRPI, when compared to the pure tone audiometry results, and that the cortical responses weren't normal for the frequencies tested. This shows a certain vulnerability of the auditory system in neuron-level, which could be confirmed by the speech-discrimination and cortical response tests, two of the most sensitive tests available for detecting central hearing loss[33].

Other clinical and epidemiologic studies enable us to state that there is a relation between a series of solvents and alterations in the central auditory pathways, in addition to perceiving in audiometric findings that these solvents cause hearing loss ranging from mild to moderate degree[34]. Such evidences point to the importance of performing speech audiometry in workers exposed to high SPL, especially when this exposure is associated with other risk factors.

According to OS 608, performing speech audiometry is recommended only with the purpose of measuring the social value of hearing, i.e., the consequences of hearing loss in the worker's auditory capacity[7]. Most of the time, taking the speech audiometry is optional, a practice that had reflections in the evaluation of this process by the consulted experts. Therefore, this process needs to be revised, in accordance with the recommendations and the technical and scientific advancements.

The factors that may influence the HCP results were presented taking into account aspects considered important for a good implementation of the program, according to the documents under consideration. The NR 07, NR 09 and OS 608 present some elements that make evident the importance of the contextual factors for making the HCP feasible, such as the involvement of the company's health and security professionals, industrial management, human resources and, most of all, the workers; the characteristics of the risks and the need for control; and, the articulation between current norms[7,17,18]. Thus, establishing the responsibilities of everyone involved in developing, implementing and managing the HCP is a basic guideline for structuring the program[30].

The structural factors also have a very important role in the program, with direct influence on the results. Such aspects can be made evident by the lack of audiologic management, the use of uncalibrated audiometers, the lack of issuing work accident reports, and/or lack of actually effective noise control measures[28,35].

Among the HCP activities, the lectures, workshops and debates offered to workers and/or other participants of the program was deemed as a valid process by the experts (I-CVI = 0.9), which reinforces the need to promote knowledge about the program among the participants, as well as their commitment.

Results obtained through the answering of questionnaires before and after offering educational lectures to 15 workers participating in a HCP implemented in a food company made evident that, regarding all themes addressed in the lectures, there were workers who improved their understanding about hearing conservation issues, which reaffirms the importance of this practice[36]. The educational actions must be developed around relevant themes, making use of additional didactic resources, as: banners, posters, booklets, stands, among others, in a language befitting and attractive for the worker[37]. Such actions promote the involvement and the motivation of those participating in the program, especially the workers, thus contributing to the effectiveness of the proposed actions and, consequently, the prevention of occupational hearing loss[30].

In face of the different perspectives in analyzing the factors that may influence the implementation of the HCP, the political and contingent contextual analysis model[18] was used as a reference, considering the organizational properties and the managerial attributes of an organization as central elements for the contextual analysis, as well as the power play and personal interests of people directly involved with the implementation of the actions in the different related environments. It may be presumed that the political

aspect (considering the personal interests of participants) is interfered by structural factors (characteristics of the organization, environment and strategies of the participants), thus influencing the context in which the intervention is implemented.

The HCP manager must have some knowledge about all the aspects of the program and the current legislation, in addition to promoting the articulation of the involved sectors, establishing the requirements for hiring third party services and the acquisition of equipment and materials whenever necessary[30]. It's important that such factors be further developed and taken in consideration in the functioning of the HCP, as well as its negative and positive influences in the level of implementation of the program and its contribution for establishing goals.

Studies point to the importance of the OM schematization as an analysis tool during the program's implementation, with the role of making the strategies explicit in a clear and practical way. It's an aid in the process of communicating and spreading the strategies to those involved, and a facilitator in decision-making, guiding the implementation of the program in other contexts, favoring evaluation and expansion processes, besides bringing to surface evaluative questions in the context of implementing the actions, thus strengthening and guiding the evaluation of programs in the field of health[38-40].

CONCLUSION

The Operating Model of the Hearing Conservation Program could furnish a visual representation of how the program works, with the purpose of understanding the interaction between its many components and activities, thus, being useful for outlining its theoretical presuppositions.

The elements related to the HCP's structure include physical, human and organizational resources, which enable the implementation of a set of processes that lead to identifying, analyzing, monitoring and controlling the exposure of workers to high SPL, associated or not to other risk factors, which might favor the triggering and/or development of Occupational NIHL.

The components listed on the modeling of a program must not be considered as static and permanent, as constant revisions and improvements are made necessary, considering the emerging technical and scientific advancements regarding the program.

Finally, the components that constitute the Operating Model of the Hearing Conservation Program validated by the experts may support evaluative practices, aiding the professionals involved in the program, in addition to enabling the collection of a set of indicators, which can be used as essential criteria for the development of evaluation instruments.

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