

MANAGEMENT OF CHANGES FOR NOISE CONTROL IN NEONATAL INTENSIVE THERAPY: EXPERIENCE REPORT

GERENCIAMENTO DE MUDANÇAS PARA CONTROLE DO RUÍDO NA TERAPIA INTENSIVA NEONATAL: RELATO DE EXPERIÊNCIA

GESTIÓN DE CAMBIOS PARA EL CONTROL DEL RUIDO EN LA UNIDAD DE CUIDADOS INTENSIVOS NEONATALES: INFORME DE EXPERIENCIA

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Funding: No funding.

Submitted on: 2017/09/04

Approved on: 2018/11/19

ABSTRACT

The objective of this study was to report an experiment on participatory planning and management of changes for noise control in a neonatal intensive care unit of a public teaching hospital in the Triângulo Mineiro. This is a research project that had the university outreach activities as one of its interfaces. The motivation for its development was to support the hospital's strategic objectives to guarantee the quality of patient care and patient safety before the articulation between teaching-research-outreach activities and care provision. The theoretical-methodological framework that guided the conduction of the experience was the logical framework, historically derived from planning methods that guaranteed spaces for teamwork and the participation of the various stakeholders in the project. The management of changes was conducted by a managerial group with expertise in the theme, represented by local workers and teachers/researchers. Activities took place between April and May/2017. The diagnosis of the problem-situation counted on a measurement of the noise in the place before the interventions (level between 62-82 dB); the perception of noise in the sector was high and very high according to 88.3% of the workers. The results obtained were: engagement of hospital authorities and the responsible for legitimization in the proposal; sensitization and training of workers, teachers/researchers, residents and academics to control noise; and implementation of measures to control noise. Changes were jointly articulated among workers, university representatives, and managers: in the infrastructure of the environment, in the direct handling of the newborn, and in the attitude of the team. There is a need for longitudinal follow-up regarding the way the initiatives have impacted on noise reduction and on the well-being of workers.

Keywords: Noise Monitoring; Intensive Care Units; Neonatal; Participative Planning.

RESUMO

O objetivo deste estudo foi relatar uma experiência sobre planejamento participativo e gerenciamento de mudanças para controle de ruído em uma unidade de terapia intensiva neonatal de um hospital público de ensino no Triângulo Mineiro. Trata-se de um projeto de pesquisa que tem a extensão universitária como uma de suas interfaces. A motivação para seu desenvolvimento foi apoiar os objetivos estratégicos do hospital, para garantir a qualidade assistencial e a segurança do paciente frente à articulação entre ensino-pesquisa-extensão e assistência. O arcabouço teórico-metodológico que orientou a condução da experiência foi o quadro lógico, historicamente derivado de métodos de planejamento que garantiam espaços para o trabalho em equipe e a participação dos diversos interessados no projeto. O gerenciamento da mudança foi conduzido por grupo gestor com expertise na temática, representado por trabalhadores locais e docentes/pesquisadores. As atividades ocorreram entre abril e maio/2017. O diagnóstico da situação-problema contou com mensuração prévia às intervenções do ruído no local (nível entre 62-82 dB), sendo a percepção do ruído no setor alta e muito alta, segundo 88,3% dos trabalhadores. Os resultados alcançados foram: engajamento de

How to cite this article:

Barsam FJBG, Barbosa CLS, Oliveira CR, Lima LCS, Ferreira DO, Silva MSS, Camargo FC. Management of changes for noise control in neonatal intensive therapy: experience report. REME – Rev Min Enferm. 2019[cited _____];23:e-1154. Available from: _____ DOI: 10.5935/1415-2762.20190001

legitimadores e autoridades do hospital na proposição; sensibilização e capacitação dos trabalhadores, docentes/pesquisadores, residentes e acadêmicos para o controle de ruídos; e implantação de medidas para controle do ruído. Mudanças foram articuladas conjuntamente entre trabalhadores, representantes da universidade e chefias: na infraestrutura do ambiente, no manuseio direto do recém-nascido e na postura da equipe. Faz-se necessário seguimento longitudinal sobre como as iniciativas impactaram na redução do ruído e no bem-estar dos trabalhadores.

Palavras-chave: Monitoramento do Ruído; Unidades de Terapia Intensiva Neonatal; Planejamento Participativo.

RESUMEN

Se presenta la experiencia en planificación participativa y gestión de cambios para el control del ruido en la unidad de cuidados intensivos neonatales de un hospital escuela público del Triángulo Mineiro. Proyecto de investigación del programa de extensión universitaria con miras a apoyar los objetivos estratégicos del hospital y garantizar la calidad de la atención y la seguridad del paciente ante la articulación entre enseñanza-investigación – extensión y atención. La experiencia se basa en el cuadro lógico derivado de métodos de planificación que aseguran espacios para trabajar en equipo y la participación de distintos interesados en el proyecto. La gestión de cambios se llevó a cabo por el grupo gestor con experiencia en el asunto, representado por trabajadores locales y docentes/investigadores. Las actividades se realizaron entre abril y mayo de 2017. El diagnóstico contó con la mensuración preliminar del ruido (niveles entre 62-82 dB); percepción de ruido alta y muy alta según el 88,3% de los trabajadores. Resultados: se observó el compromiso de legitimadores y autoridades del hospital con la propuesta; sensibilización y capacitación de los trabajadores, docentes/ investigadores, residentes y académicos para el control del ruido y la implantación de medidas de control del ruido. Se programaron cambios entre trabajadores, representantes de las universidades y gerencias: en la infraestructura del ambiente, en la manipulación directa del bebé y en la postura del equipo. Es importante efectuar el seguimiento longitudinal del impacto de estas iniciativas en la reducción del ruido y en el bienestar de los trabajadores.

Palabras clave: Monitoreo del Ruido; Unidades de Cuidado Intensivo Neonatal; Planificación Participativa.

INTRODUCTION

Patient safety has been a prominent concern in hospitals over the last few decades.¹ Patient safety can be understood as reduction of risk of unnecessary harm associated with health care to an acceptable minimum, which is specially understood as the articulation between existing scientific evidence and available resources in the context in which care is provided, including decision-making of health care professionals to control risks inherent in each situation.^{1,2} Although noise monitoring does not represent a priority of the National Patient Safety Program², the importance of its control in Neonatal Intensive Care Units (NICU) has been demonstrated, since inadequate noise in these environments during the care provision can cause harm to the neonates of physical, social and/or psychological nature.^{3,4}

Neonatology care has focused on minimizing handling newborns and providing a quiet environment for them. Pre-term newborns, in particular, are at risk of developing cognitive, motor and behavioral disorders when compared to full-term infants, and in the NICU, they are subjected to stresses due to high intensity noise. The noise in this scenario is higher than in most home environments, besides being disturbing and happening at irregular intervals. These are concurrent auditory signals that often challenge premature newborns, their families, and workers.^{3,4}

A recent systematic review demonstrated the importance of strategies for noise monitoring in the NICU environment.³ When it comes to Brazilian public teaching hospitals, the challenges for noise control are even greater. Thus is true, first, because they are spaces of high circulation of people. As a traditional locus of teaching-service integration, besides workers, there are also teachers, researchers and students of different levels of training circulating in this space.⁵ Another challenging aspect is related to the culture of Brazilian hospitals, which usually contains elements related to a rigid organizational structure and centralization of power, resulting in difficulties for the development of teamwork and the participatory engagement of workers in favor of changes.⁶ There is a notable shortage of research addressing initiatives that involve actions planned and implemented in a participatory manner by NICU teams. In this perspective, the present study aims to report on the experience of participatory planning and management of changes for noise control in a NICU of a public teaching hospital.

DESCRIPTION OF THE EXPERIENCE

This is an experience report resulting from a research project with interface with university outreach activities entitled "Evaluation and noise control in a Neonatal and Pediatric Intensive Care Unit"^{1a}. The scenario was the neonatal intensive care unit, with 20 beds, of a large general, public, teaching hospital (332 beds), which is a macro-regional reference for high-complexity care in the *Triangulo Sul de Minas Gerais* pole, Brazil. The motivation for the development of the project was to offer support to the hospital's strategic objectives, whose mission is to guarantee quality patient care and patient safety in relation to teaching-research-outreach and care activities.

The theoretical-methodological guiding framework for conducting the experiment was the logical framework (LF). In general, the LF is a matrix created by a process of structur-

¹ of the GG included the structuring of the proposition among the other workers, the project of university outreach activities linked to the *Setor de Pesquisa e Inovação Tecnológica da Gerência de Ensino e Pesquisa* of the HC-UFTM, PROEXT Announcement 04/2016 – Continuous Flow, *Universidade Federal do Triângulo Mineiro*.

ing the elements considered most important in a project – it corresponds to the systematic and succinct presentation of a proposition of change of realities. Historically, the origin of LF was derived from planning methods that were concerned with securing larger spaces for teamwork and for the participation of the various stakeholders in the project. It is based on the concepts of Management by Objectives, Logical Framework Approach and Zielorientierte Projektplanung (also known as ZOPP method).⁷

Understanding the logic of LF in practice, contrary to what it is suggested, does not necessarily mean coherence of reasoning or universal ideas. It is conceived by the effective participation of the involved ones, facilitating the communication, and in the participatory processes the shared decisions are more easily understood, thus resulting in the engagement of the team and, therefore, in commitment with the proposal. The concerns for those who use LF are, above all, transparency and precision. Considering the complexity of human communication, the method suggests the application of a language that contributes to the reduction of interpretations and misunderstandings. The organizations responsible for the project and the end users receive the expected benefits.⁷

The components of the LF integrate a vertical (columns) and horizontal (lines) logic. Thus, the framework is structured in: higher objective – broad and with character of vision of the future; project objective – measurable contribution of the higher objective, explaining the purpose of the intervention; results – descriptors of the scope of the project, in such a way that the management of the proposition can assume responsibility over its scope; main activities – description of actions essential to achieve the desired result; inputs and resources – corresponding to the activities, which in LF are presented as estimates, being detailed in the operational plan; objectively comparable indicators and sources of confirmation. A differential component of LF are the important assumptions – they correspond to those aspects that deal with external factors that can influence project management, which are important for the success of the intervention, that is, they represent the risks and limits of the context.⁷

In order to achieve the management of participatory change in noise control, a small group was formed composed of employees from the same sector who had expertise on the subject “noise monitoring”, with previous experience in participatory planning. The members, called the project management group (MG), were: two nurses specialized in Neonatology and Pediatrics, one neonatologist physician and teacher of the university linked to the teaching hospital, one nursing technician, one nursing resident, and one speech therapist. The assignments development of activities to achieve results and adequate registration of activities,

composed a dossier called project documents. Data were recorded in minutes, reports and structured guidelines specific to the project, according to the activities developed. The results presented correspond to the analysis of the records and documents of the project. Regarding the ethical aspect, the Resolution 466/2012 of the NHC was respected, and the research was approved by the *Comitê de Ética em Pesquisa* of the *Universidade Federal do Triângulo Mineiro*, in 2017, under Opinion nº 58215416.7.0000.5154. The project was started after the participants signed the Informed Consent Term.

REPORT OF THE EXPERIENCE AND DISCUSSION

The actions began on April 15, 2017, and were concluded on May 20, 2017. There were concomitant activities being undertaken. The diagnosis of the problem-situation – “noise monitoring in the sector” – was carried out in partnership with the hospital’s engineering team, which carried out the measurement of noise and the synthetic reporting. The components of the LF of this report, which guided management of change (Table 1), are described below.

The first initiative was to inform the top management representatives of the hospital about the diagnosis of the problem-situation, which occurred through brief meetings, presenting a summary report in April 2017. Therefore, there was a dialectical approach in the different categories of workers in the sector, through an awareness-raising meeting lasting 60 minutes. The previously formalized space for the Continuing Education of the team was used. Four meetings were held in March 2017 – one in each shift (morning, afternoon and night – in which there was a team on odd days and another on even days), totaling 63 participants, corresponding to the participation of 52.5% of the sector. The participants included nursing technicians (n = 38), physicians (n = 14), nurses (n = 6), physical therapists (n = 1), two clerks, a cleaning assistant and a speech therapist. When questioned about the perception of noise in the sector, 53 people (88.3%) considered it high and very high, while seven workers considered it normal. Then, the report on the measurement of noise was presented to the participants, showing the distancing of the real average value compared to the adequate noise suggested by the current Brazilian standardization. Therefore, after sensitization meetings, the participants were asked to present feasible short-term suggestions for the adequacy of the noise, in a written form, without need of identification, in a list of suggestions available at the nursing care post.

After the systematization of this information, on April 18, a meeting conducted by the MG, was held in an appropriate room at the hospital’s dependencies, which lasted 90 minutes.

Table 1 - Logical framework for management of changes for noise control in the Neonatal Intensive Care Unit of the Teaching Hospital. Uberaba, Minas Gerais, 2017

Logical Framework	Project Title: Evaluation and noise control in a Neonatal and Pediatric Intensive Care Unit		
	Project Duration: 30 days	Responsible: Manager Group	Date of preparation: March/2016
Logic of Intervention	Comparable indicators	Source of Evidence	Important Assumptions
Higher Objective Care Quality and Patient Safety in the NICU	<ul style="list-style-type: none"> Reduction of days of hospitalization; Number of qualified hospital discharges/month; Increased turnover rate/year. 	Institutional Reports	Priority in institutional policy
Project Objective Control of Noise in the Neonatal-ICU	<ul style="list-style-type: none"> Noise reduction measured 62-82dB for safe levels 35-45dBa.^a 		Sufficiency of administrative, intellectual and financial resources
Results 1. Headers and authorities of the HPE engaged the goal	<ul style="list-style-type: none"> Report on the diagnosis of the problem-situation for top management of the HPE; Number of meetings and contents discussed in the top management about the proposition. 	Project Documents	There are no objections from the hospital autarchy
2. Workers of the sector, teachers/ researchers, residents and academics sensitized and trained to control noise	<ul style="list-style-type: none"> Number of qualifications performed; Topics covered; Number of participants per qualification according to professional category; Survey of perceptions of noise at work; Survey of possible measures to be implemented. 		There is no resistance from the industry community regarding noise mobilization
3. Implemented noise control measures	<ul style="list-style-type: none"> Description of the implemented noise control measures. 		Limitations in the institutional budget, being essential the low cost measures

^a Determination n° 10.152, Brazilian Association of Technical Standards – ABNT.

The participants were invited to participate: the responsible nursing technician and the responsible medical technician, the representative of the Hospital Infection Control Commission (HICC), the representative of the Waste Management Unit, two representatives of Clinical Engineering, the Radiology technician and the technician responsible for the Enteral Nutrition Sector, the preceptor of the Nursing and Multiprofessional Residency Programs of the Hospital and the Staff of the Medical Residency Program of the Sector. The main purpose was to present the diagnosis and discuss possible propositions in the short term to address the problem. The result was minutes of commitments signed by the participants.

The measures surveyed by the workers in the sector and agreed upon for implementation among the responsible for legitimization were measures related to the infrastructure of the environment related to the direct handling of newborns and the attitude of the team. On the infrastructure of the environment, there was agreement on the standardization of reduction of volume of alarms and incubators and on the adequacy of the furniture (such as rubber feet of chairs and models of dumpsters with silent lids). The direct handling of newborns corresponded to the implantation of two protocols created in the institution: one on minimum handling of newborns and another on non-pharmacological measures against pain for the immediate assistance to inconsolable crying newborns. Also, the action called “Soninho’s Hour” (“restful sleep hour”) was implemented, in which the entire unit should be completely silent, with staff close to the bed to respond promptly to alarms, the bookkeep-

ing team near the telephone to answer it as soon as it rings, reduced lighting, and minimum handling respected from 12 a.m. to 1 p.m., from 3 p.m. to 4 p.m., from 10 p.m. to 11 p.m. and from 4 p.m. to 5 p.m. The guidance passed on to family members followed initiatives corresponding to this dimension.

Regarding the attitude of the team, the monitoring of the behavior of on-callers and residents of the different areas by the staff and preceptors for maintenance of silence were considered, as well as the prohibition of the use of noisy shoes, and the use of cell phones and beeps in silent mode only. The entire team was also directed to communicate through soft speech, with relaxed vocal effort, and exchange of talking with acoustic intimacy, comfortable for workers and family – facilitating the neonate’s physiological sleep. In addition, it was proposed that discussions of clinical cases be conducted in a specific room.

In this dimension, the action called the “guardian of silence” was highlighted, in which four workers of different categories were randomly selected at the start of the shift to wear a red colored armband during their work shift. The workers with the armband had as duty to watch over the silence of the unit, alerting the colleagues about critical situations and inadequate conducts, verifying the reduction of noise. At the end of the shift, the armbands were transferred to new guardians to ensure continuity of silence in the sector.

A recent experience in a teaching hospital in the United States was found in the literature to present similarities with the present report. The North American experience incorporated noise measurements prior to the intervention, with an

average value of 57.0 dB (standard deviation \pm 0.84). The intervention integrated initiatives such as involvement of employees and visitors regarding their opinions and perceptions of noise levels. Then, feedback was presented on levels of measurement for awareness and engagement in favor of noise reduction strategies. Continuous discussions with the clinical staff were included for the implementation of reduction of alarms of equipment, the “quiet time” in the unit, and the continuing education program for employees.⁸

Experience in a teaching hospital in Mexico to reduce noise in a NICU integrated similar initiatives regarding the adequacy of the infrastructure of the environment and the training of the team. The average pre-intervention noise gauging was 61.8 dB (standard deviation \pm 4.4).⁹ In a Canadian hospital, an audit system identified averages between 45 and 55 dB in this sector of the hospital.¹⁰

Considering this reality, it can be observed that the noise control in NICU is an action of interest in teaching hospitals in different parts of the world,⁸⁻¹⁰ considering that the values were above those recommended before the intervention. For teaching hospitals in Brazil, the present report contributes to the presentation of potential forms of participatory planning, for the engagement and expansion of commitments of the team working to control noise.

The culture of Brazilian hospitals is determined by traditional and formal organizational practices that place little value on the promotion of interpersonal relationships, motivation, and satisfaction of workers. Overcoming these practices tends to positively influence the quality of care and patient safety culture in hospital institutions as a whole.^{5,6} A limitation of this research was the need for longitudinal monitoring of the impact of the implementation of the interventions proposed to reduce noise in the study scenario.

CONCLUSION

Noise control in NICU has been as a topic of interest for teaching hospitals in different localities around the world, especially for presenting noise measurements above those recommended for this scenario to be safe for neonates. At the teaching hospital studied here, the scenario presented a similar reality, with noise measurement between 62 and 82 dB. Considering that noise reduction requires a set of differentiated interventions and, especially, the commitment of the team working in the NICU, the reported experience presented the logical framework as an instrument adopted for the conduction of participatory planning and management of changes for control of noise.

The teaching-research-outreach activities and care integration, the existence of structured reports (dossiers) on the

problem-situation and the holding of joint meetings between managers and teams in the different shifts were considered as facilitating factors for the management of changes. Moreover, the articulated action between workers in the sector and the people responsible for legitimization of the process – represented by the hospital autarchy – enabled the development of a broad set of measures that included changes in the infrastructure of the environment, in the direct handling of newborns and in the attitudes of the team. The logic of the presented intervention aimed to increase the quality of care and patient safety in the NICU.

Although the initiatives presented are the result of a collective construction contextualized in a specific scenario within a certain period of time, there is potential for replication of the proposals presented – in view of scenarios with common specificities. Further research should be undertaken to identify other factors that contributed to the implementation and management of changes, as well as to the motivation and satisfaction of workers, students and teachers in integrating the proposition. It is also important to carry out research on how the experience contributed to the consolidation of a differentiated space for multiprofessional training, and especially longitudinal research on how the initiatives have contributed to the reduction of noise and to the well-being of workers.

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