EXPERIENCE REPORT
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Safety in drug administration: use of Bizagi® software and application of the pillars of Triple Aim

Segurança na administração de medicamentos: utilização do *software* Bizagi® e a aplicação dos pilares do *Triple Aim*

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ABSTRACT

Introduction: Public and private hospital institutions have constantly experienced problems attributed to the safety and quality of care provided to their users. **Objective:** Introduce the implementation of a uniform and safe medication administration process using the pillars of Triple Aim. **Method:** Intervention applied research, with the support of the Process Management modeling stages carried out in an inpatient unit of a pediatric hospital, involving 23 nursing technicians and four nurses. **Results:** There were four stages: Describe "AS IS", in which the existing reality was seen represented in Bizagi®, BPM software; Plan "TO BE", in which the process for implantation was developed, considering the case of Triple Aim and the nine rights of the administration of medicines, represented by Bizagi®; Act "TO DO", in which the implementation of the process defined through on-the-job training took place; and Evaluate "Control", in which focal groups and interviews were carried out, verifying the professionals' experiences about the process implemented. **Conclusions:** The implementation of the latest updates in the drug process through management tools, process modeling software and international initiatives has contributed to the safety in care process and also to continue looking for improvements in the nursing team's performance.

KEYWORDS: Patient Safety; Medication Errors; Pediatrics; Medication Systems in the Hospital

RESUMO

Introdução: As instituições hospitalares públicas e privadas têm vivenciado constantemente problemas atribuídos à segurança e qualidade da assistência prestada aos seus usuários. **Objetivo:** Apresentar a implantação de um processo uniforme e seguro de administração de medicamentos utilizando os pilares do *Triple Aim*. **Método:** Pesquisa aplicada de intervenção, com apoio das etapas de modelagem da Gestão por Processos realizada em uma unidade de internação de um hospital pediátrico, envolvendo 23 técnicos de enfermagem e quatro enfermeiras. **Resultados:** Ocorreram quatro etapas: descrever *As Is*, na qual se conheceu a realidade existente representando-a no Bizagi®, *software* de BPM; planejar *To Be*, na qual se desenvolveu o processo para implantação, considerando o *case* do *Triple Aim* e o nove certos da administração de medicamentos, representado pelo Bizagi®; agir *To Do*, em que se deu a implantação do processo definido através da capacitação em serviço; e avaliar *Control*, na qual se realizaram grupos focais e entrevistas para verificar as vivências dos profissionais sobre o processo implantado. **Conclusões:** A implantação das mais recentes atualizações no processo de medicamentos através de ferramentas de gestão, *software* para modelagem de processo e de iniciativas internacionais contribuiu para a segurança do processo assistencial e para a busca de melhorias contínuas na atuação da equipe de enfermagem.

PALAVRAS-CHAVE: Segurança do Paciente; Erros de Medicação; Pediatria; Sistemas de Medicação no Hospital

INTRODUCTION

Public and private hospitals often experience problems attributed to the safety and quality of care provided to their users, so the pursuit of mechanisms that can curb errors or adverse events to patients is a major concern of managers and a key part of their agenda[1].

A global milestone for health quality and safety was achieved with the publication of *To err Is human: building a safer health system*, in 1999, by the *Institute of Medicine* (IOM) of the United States. The publication drew attention to the problem by stating that 44,000 to 98,000 people died every year in the United States as a result of adverse healthcare events[2]. After that, in 2012 the World Health Organization (WHO) began to address the issue of quality of care as a priority and launched campaigns that culminated in the important World Alliance for Patient Safety in 2004[3].

In Brazil, ever since 2008, the National Health Surveillance Agency (Anvisa) and the Ministry of Health (MS), in partnership with the Pan American Health Organization[4], have been doing campaigns to disseminate safe and foolproof practices in healthcare. This partnership resulted from Brazil's entry into the World Alliance for Patient Safety, from which several safety and quality of care actions emerged[5].

Considering quality requirements, in 2008, the *Triple Aim* international initiative was launched by the *Institute for Healthcare Improvement* (IHI) with the objective of changing our mindset when it comes to providing care. The focus is on improving the care process with a systemic view of the patient's experience and thus improve treatment, health, in addition to reducing unnecessary costs[3]. Nevertheless, using a methodology to guide deployments in process redesign is essential, so that we can meet the established requirements for quality assurance. Process Management is an effective alternative that seeks a systemic and integrated perspective to achieve results for all the stakeholders. It also uses process redesign software, like Bizagi®, which is easy to use and freely available[6].

In nursing, the quality of care has been a concern for a long time, at least ever since Florence Nightingale, who was concerned about systematizing care for better results[7]. One of the activities performed by the nursing team is the administration of medications, currently according to professional regulations, under the direct responsibility of the nursing technician. This should occur under the supervision of a nurse, who is responsible for the entire preparation process[8].

The drug administration process must include: adequate structure for drug sorting and preparation; a clearly described, safe and integrated process; in-service training to engage and continuously update the professionals, with satisfactory outcomes for the patients, institutional sustainability, and without waste and technical mistakes[9,10,11].

The chosen hospital is recognized because of its unwavering concern with quality and safety processes, mainly by the senior management (manager and director), with continuous focus on improving the medication administration process. Since this is a hospital that serves pediatric patients, the medication administration process is even more delicate and risky, requiring focus on staff training and the pursuit of safety barriers. This context gave rise to the research question we investigated: how can the redesign of the drug administration process through the methodology of Management by Processes and the *Triple Aim* pillars improve quality and safety in one of the inpatient units of this pediatric hospital? In order to answer this question, our objective was to establish a uniform and safe process of drug administration in an inpatient unit of a pediatric hospital using the Management by Processes methodology and the pillars of *Triple Aim*. The result would be the preparation and delivery of a report to the senior management of the hospital.

METHOD

Applied intervention research that used the guiding pillars of the *Triple Aim*, defined by the international initiative as pillars to improve care quality and safety, at lower costs and better health for the population. Defining a process considering those three pillars enables us to meet current real needs and supports the implementation of actions with international focus.

The intervention methodology considers that:

> Most improvement processes follow the same cycle. Problem solving, for example, begins with identifying the problem, planning a solution, implementing it, monitoring it, and evaluating its effectiveness. Similarly, medical treatments also follow a cycle: symptom monitoring, disease diagnosis, drug prescription, treatment, monitoring and evaluation of results[12].

The steps of the intervention methodology were aggregated through Management by Processes. The intention was to create a systematic logic for the study and provide community, service and educators with a product that can be used in any hospital unit, represented by the Bizagi® software, and promote easy interpretation and design of work processes.

The Bizagi® software used for process modeling and automation supports operational processes to add value, reduce waste and improve organizational performance[13].

The tool features symbols that support the viewing of conducts and actions in the process stage. The meaning is assigned as described in the user guide of the Bizagi® software[13]. In order to clarify the representation of the processes through the software, we prepared Figure 1 with the meaning of the main symbols used in the Bizagi® tool.

The research subjects were 27 nursing professionals who worked in the inpatient unit, of which four were assisting nurses and 23

were nursing technicians, distributed in four work shifts (morning, afternoon, evening and night).

The steps for implementing the intervention were the following:

Describe "As Is", in which the current process is designed through the monitoring of reality, aiming to verify the opportunities for improvement;

- Plan "***To Be***", which defines the ideal process, considering safe and qualified literature and practices;
- Act "***To Do***", in which the established process is implemented through the training of the stakeholders and provision of the necessary resources;
- Evaluate "***Control***", which seeks to measure and evaluate whether any improvement has occurred in the new process[14].
- In this last stage, we used the focus group method with three guiding questions to survey improvement opportunities and establish corrective actions. In the data collected in the last stage, "*Control*", we did a content analysis as established by Bardin[15] to help us achieve the research objectives.

In order to structure the content analysis, the research followed methodological rigor: preparation of information, unification of content in record units, classification of record units, description and interpretation.

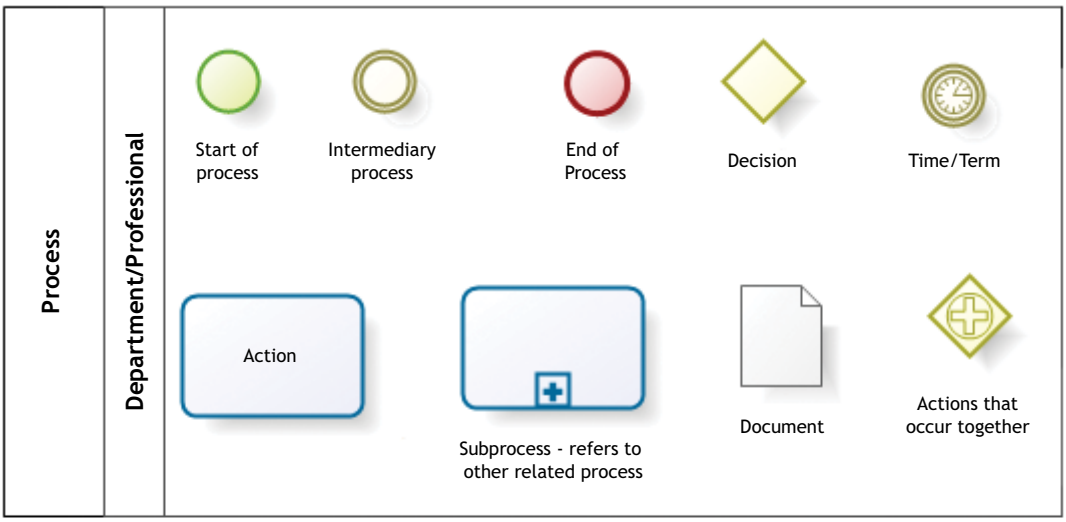
The research was approved by the Research Ethics Committee Opinion n. 1.212.494 and all subjects received the Informed Consent Form (ICF) according to the rules established by Resolution n. 466, of December 12, 2012[16]. The Hospital Infection Control Commission (HICC) of the hospital also accompanied the implementation process, because of its direct relation with the established actions.

RESULTS AND DISCUSSION

In order to structure the results and the discussion, we decided to organize the interventions in stages, which are detailed and correlated with the literature on the subject. The four steps derive from process modeling and the Management by Processes methodology. They aim at elucidating the methodological path adopted in the research.

Describe "*As Is*"

At this stage, we did the reality diagnosis, seeking information on how the process works in the practice of nursing professionals in the unit under study. One of the researchers went to the unit and monitored the conduction of activities with design in the Bizagi® tool. The professionals contributed with information and demonstrated their routine in practice. Bizagi® is a business process management piece of software that enables a visualization of the current situation[17].



Source: Prepared by the authors (2016).

Figure 1. Meaning of Key Symbols - Bizagi® - Business Process Model and Notation (BPM) software.

Figure 2 details the findings of the current process and suggests a discussion about practices to other studies on the subject.

When it comes to quality of care and safety process, the most relevant point was the preparation of the drug away from the patient and long before its administration. Drug preparation as close as possible to administration is a safety process that ensures the chemical stability of the substance and prevents serious events caused by improper and non-recommended practice[8,18,19].

Another issue was the absence of the use of the five rights of medication administration. The distancing of care activities from the patient and the fact that the medications of several patients were on the same tray may lead to errors in the care process. Furthermore, some professionals did not check the identification wristband through the full name and date of birth, which is a requirement of the International Safety Goals already implemented in the institution and also a component of the first right of medication administration.

Thus, the updated safety mechanism for medication administration finds room in the nine rights, an evolution of the five rights of medication administration[17]. The nine rights of medication preparation and administration include: the right patient; the right drug; the right route; the right time; the right dose; the right documentation; the right action; the right form; and the right response. In all these items the main distinctive action is the participation of the patient/caregiver/family in the process[11].

If the documentation stage happens far from the time of administration, there can be communication interference with the medical team, which may keep or change the therapeutic plan without knowledge of the patient's real situation; forgetfulness or improper documentation as a result of transcribing information from a "draft" to the official document - the prescription - can also cause errors and jeopardize patient care[8,18,20].

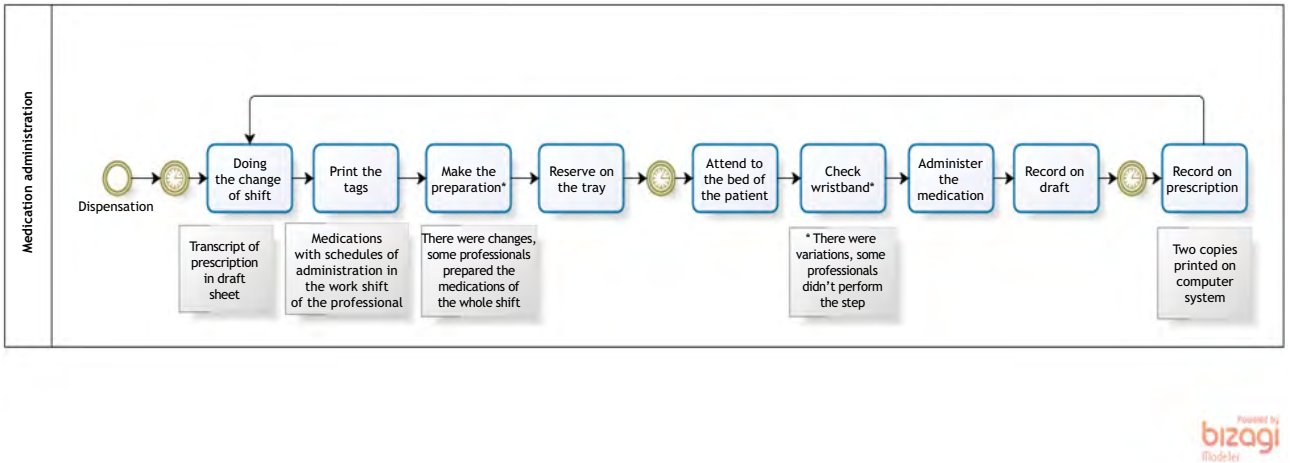
Mention should also be made of the repetition of the documentation activity in three documents, the first and second copy of the prescription and the computer system. When mapping the current situation, the nursing technicians performed this at the end of the work shift. Those were moments of some confusion, with many professionals talking and discussing several topics at the same time, which can also cause distraction.

Considering all the resources involved, the general design of the process directly influences the safety barriers, in this specific case, of medication administration. Repetitive activities and at different times also lead to errors, so establishing a structured and logical process is key[21].

Planning *"To Be"*

In the planning stage, we sought to establish a theoretical framework to support the definition of the process to be implemented and enable the resolution of the notes presented in *"As Is"*. Plan *"To Be"* aims to define the improvement of the findings in the current process, described in *"As Is"*, in order to attain better results[22].

The pillars of the *Triple Aim* were followed through the use of actions set out in a case described in the *Pursuing the Triple Aim*[3] book, which provided for approximation of patients and professionals at the time of drug administration; minimization of disturbance and side talking during the preparation and administration process; adoption of the rights in medication administration; family/patient communication and engagement in the medication process; and administration documentation immediately after it is done.



Source: Prepared by the authors (2016).

Figure 2. Current process of medication administration at the pediatric inpatient unit surveyed.

Concerning the rights of medication administration, we added the nine rights of medication administration products, as described in Anvisa's "Prescription, Use and Administration Safety Protocol"[11], with the following definitions: right patient, right drug, right route, right time, right dose, right documentation, right action, right form and right response.

Some points of greater relevance in the medication cycle were considered, aiming at a critical view on the execution of the steps and their correlation with adverse events: the structure in which the professional does his/her work, how the preparation is made (technique), medication administration (near or far from the bed) and documents resulting from the assistance provided (before or after)[8].

To enable the process, it was necessary to acquire some resources, which were provided by the hospital's Administrative and Technical Management. Each nursing technician needed a laptop, a medication cart, individual disposal of contaminated and sharp waste attached to the carts and a seat for records that required more time.

Considering both references and resources, the following medication administration process was obtained and represented by the Bizagi® tool (Figure 3).

Upon defining the process steps, some particularities of the patient profile were considered, like the question of isolation, which makes it impossible for professionals to access the medicine cart and the laptop, given the risk of germ cross-transmission.

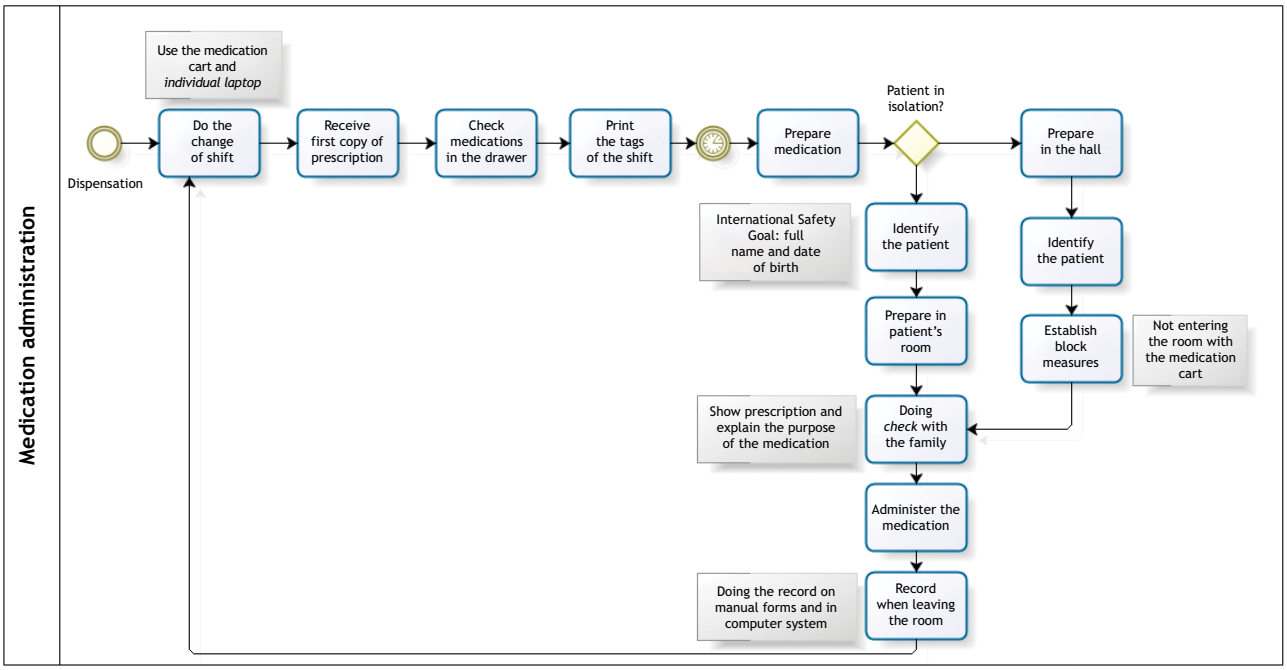
Act "*To Do*"

The process was implemented in April 2016. The implementation was led by one of the researchers, who attended the four work shifts to conduct in-service education with the nursing team about the new process, exchanging experiences and listening to the stakeholders. The training sessions lasted two hours in each work shift, with individual clarification through the follow-up of the activities. The functioning of the technological and material resources was also checked to adjust the details for the accomplishment of the activities.

This implementation action sought to correlate the existing work model and the nursing actions, providing exchange between professionals for the development and improvement of the care process.

The most challenging at this stage was to engage the professionals in replacing their previous techniques with a change in "how" they do things, provoking and encouraging them to make continuous improvements in their care practices, supported by evidence and contributions from the professionals' experience.

All professionals invited to the process change accepted the challenge and formalized their acceptance by signing the Informed



Source: Prepared by the authors (2016).

Figure 3. Medication administration process based on the pillars of the *Triple Aim* and the nine rights of medication administration described by Anvisa.

Consent Form (ICF). It was observed that adherence improved as they understood the reasons for the change and the outcomes that could occur if the previous practice was maintained.

The researcher handed out written documents to each professional to solve any doubt that could emerge in the researcher's absence. The use of a suggestion sheet was also encouraged, so that it could be used in the Evaluate *"Control"* step.

Evaluate *"Control"*

In the Evaluate *"Control"* step, we decided to listen to the nursing professionals who followed the proposed process in three focus groups with the nursing technicians and interviews with the nurses. Both techniques were used during the professionals' working hours, in morning, afternoon, evening and night shifts.

The choice to use the method at this step aims to improve the activities done by the professionals through active participation in training actions in the workplace, enabling changes and reflection about their practices[23].

The data were addressed according to the content analysis established by Bardin[15], from which six categories emerged: Closeness with Patient; Safety Promotion; Resources and Structure; Family Engagement; Time Management; and Staffing. To represent the findings, we used the resources of the conceptual maps of *Cmpas Tools* to design conceptual schemes and graph them (Figure 4).

Closeness with the patient

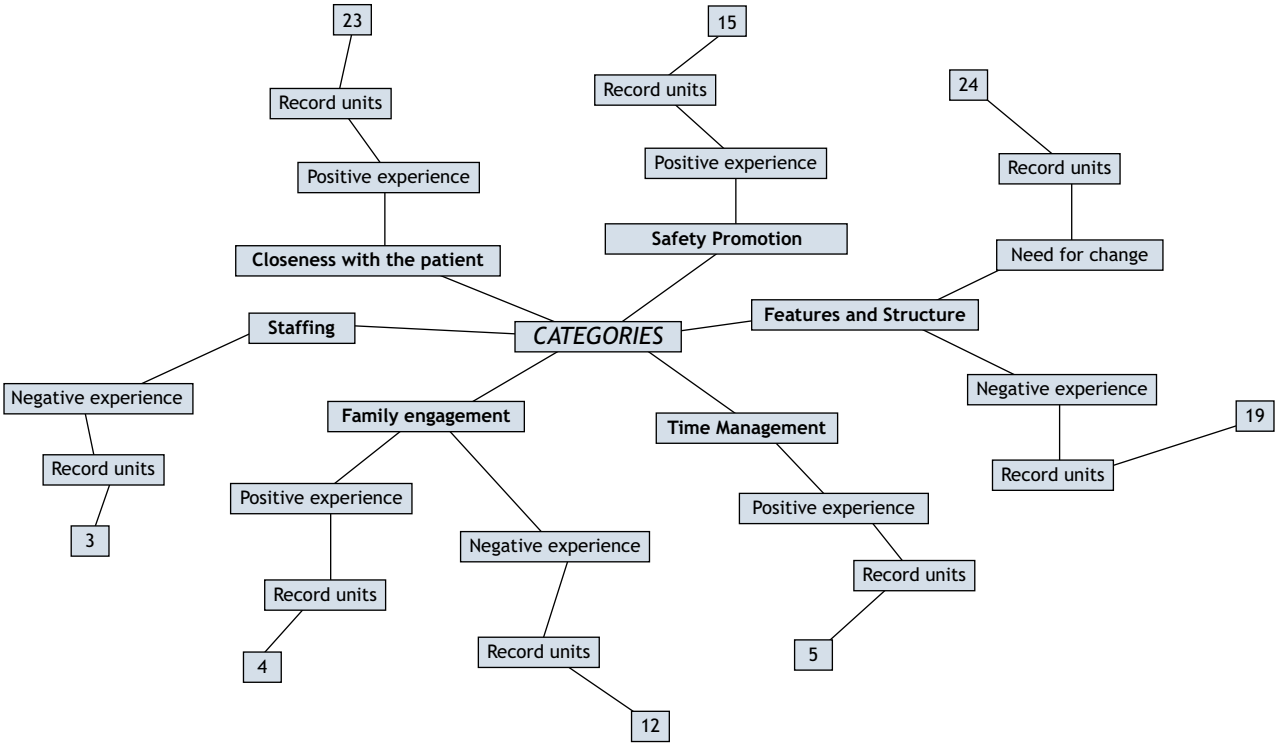
Twenty-three record units of the research subjects, from both professional categories - nursing technicians and nurses - stated that the proposed process drives the integration of the nursing team with the patients through the physical approach in the room, bridging the gap created by the previous process, when all activities were performed at the nursing station/counter.

> [...] we are now closer to the patient... sometimes even too close because they call us more often... I am more at ease because I am closer to them and see everything that happens [...] (NT1).

> [...] the other wards found it strange... nurses who are not used to this ask us where is everyone because there is never anyone at the station... it's just that now we are close to the rooms and the patients... I think that I had never been in the rooms so much ever before [...] (NT4).

> [...] I admit that I thought that getting closer to the patients was going to be bad... because here they complain a lot... but it seems that now they even complain less... I don't know if my colleagues agree [...] (NT6).

The experiences were all reported as positive, since they brought professionals and patients closer and guided the activities to add value to the care processes. To avoid errors in medication administration, working closer to patients is an effective alternative



Source: Prepared by the authors (2016).

Figure 4. Concept map of the categories found in the content analysis.

because it establishes efficient communication between professionals and those who are receiving healthcare[24].

> [...] even to hear if they need anything, we are always around now [...] (NT5).
>
> [...] Now we are taking care of patients, preparing medication that takes time, doing our things... the whole shift is like this [...] (NT8).
>
> [...] we maintain a much closer contact with the patients while in the halls... we are closer to them [...] (NT12).
>
> [...] we came closer to the patients and saw that the trays were horrible [...] (NT14).

The statements of nursing professionals also express the need to put patient care at the core of nursing activities. Discussions about care have space in nursing-related research, but they are still incipient and need more visibility, since they are directly related to the best outcomes for the patients[25].

Safety Promotion

There were 15 record units for the category, from both professional categories. They were all related to the positive experiences of nursing technicians and nurses, since the process enabled greater focus on the performance of medication administration activities. Establishing processes that promote safety barriers is known to be an important strategy, as it leads professionals to perform their activities in a way that minimizes risks from adverse events[26].

> [...] when it is, when... So, for these EV medications, which we prepared in the cart, this is much better, much safer (NT3).
>
> [...] I have already mixed the medications a couple of times, one with the other, so I had to start it all over again... I had to review everything to know what was missing... now I prepare it and administer it right away... It's much easier [...] (NT4).
>
> [...] the tray was the worst of all... although the cart is not ideal yet... the tray with all the drugs on it was horrible... Sometimes, we would forget to label the medication and had to dispose of it, because we didn't even know what it was [...] (NT14).

Because of the physical distance from the patients' beds, the previous administration process led the professionals to prepare the medications of several patients at the same time and for all hours of his or her work shift. The process that was implemented enables the reorganization of activities and the administration of medicines closer to their preparation. One of the major flaws of the medication process - which makes it unsafe - is that the preparation is made long before administration and at a single time for several patients, causing process failure and confusion and making room for mistakes[27].

Professionals need to be engaged in the continuous pursuit of safe strategies in care processes that can promote safety barriers and use experiences to ensure continuous improvement and care excellence[28].

Resources and Structure

Category that emerged from 43 record units, from both professional categories: nursing technicians and nurses. The experiences were negative and followed reports suggesting changes for the proper functioning of the process.

Because it is an inpatient unit, the difficulties are related to the size of the cart for medication preparation (too big for the existing space), the excess of medicines per patient (dispensation by the pharmacy for 24 hours), absence of keys to restrict access to medications (drawers per patient with significant volume of medications and no safety lock mechanism), semi-private rooms with little physical space for carts, and frequent wi-fi connection outages.

> [...] we can barely walk inside semi-private rooms... they are very small... there is barely some space for the patients and their family members... you can never get in with that cart... we have two, the other floors have many, so how can they get in with the carts? They can't, right? (NT1).
>
> [...] We lack the structure to do a good job, like lighter carts, good internet connection... this is missing (NT8).
>
> [...] if the medication came by shift and the pharmacy dispensed it with the materials, that would help us a lot... Receiving the drugs all together for the shift and the materials by prescription makes our work harder (NT12).
>
> [...] having all medicines already organized per shift upon dispensation would help a lot, I miss this support from the pharmacy (N16).
>
> [...] having a key in the cart to lock the medication... because we have to be careful with the children [...] (N17).

Structural and resource issues in the process of drug preparation and administration still differ. The best practice would be that the preparations were made in appropriate places, avoiding contamination, using unit doses per patient. This corroborates all the statements described above. The nursing team would be responsible for the medication administration process with strict compliance with the safety steps[29].

Determining unit and reconstituted doses from the pharmacy, answering any question about the practice of care, preserving the time of the nursing staff for direct patient care and ensuring the correct dose are safety actions that enhance the care process. In pediatrics, unit doses already handled in appropriate places and by specific professionals promote safe administration and avoid errors arising from the absence of correct techniques and/or mismanagement (preparation) in improper locations[30].

Time Management

The category emerged from six units of record of the positive experiences of nursing technicians, who considered that some activities were faster and easier to perform when they were closer to the patients. The lines below reflect the statement.

> [...] in the coffee breaks it also changed... now parents have to get coffee downstairs, but we stay there working, we are near the patients, we just leave the door open, the children stay asleep and we watch them over. Before we had to leave and they would stay there in bed, doing nothing... We would go to one bed, and then another, that takes time, you know [...] (NT3).

> [...] before we had to come here to do our work, then we had to prescribe the material to go get it, now this has changed our pharmacy routine. Back then I had to be here [at the station/counter] and sometimes they called me there... But I had to come here to make the prescription, and now I already do everything there, I'm there, then the mother just opens the door and asks for something else, you know? They don't even ring the bell, we respond to them faster too. Before we would come here, prescribe it and ring the bell... Then your prescription was released, but they would ask you for something else, then you had to come here, open it again, make the prescription again... now if they forget something, you are already there... he just opens the door and tells you (NT7).

> [...] I think that staying closer to the patient's bed saves time for us... when they ask for medication, we are already there, available... we assist the patient more, we stay closer to them... we keep busy in the corridor, so we are closer to the patient, this is a strength (NT9).

Redesigned work processes improve time management and enable deeper reflection on care practices and a different approach to professional tasks[31].

Patient safety also improves when nursing professionals reorganize their time and devote more hours to direct patient care and surveillance. This enhances quality while minimizing risks in the care process[28].

Family Engagement

Research subjects from both professional categories mentioned family engagement in 16 record units, of which 12 were negative and four were positive experiences. By participating in the care process, families also become responsible and involved in the stages of care provision.

Reports of negative experiences mainly referred to families that care for children with chronic diseases, who usually need the same care at home:

> [...] the light in the hall is the most frequent complaint... they wake up, parents wake up, but we have to turn on the lights to confirm the prescription, they don't want to confirm, but of course that later they are the first to complain (NT1).

> [...] the parents of the chronic patients laughed... they weren't impressed at all... they know everything already... and we keep repeating the same thing... every day [...] (NT5).

> [...] they think it's silly because they said we look like watchmen and that they know how to take care of their children... they say they already do everything at home (NT7).

Families of children with chronic diseases need to be engaged with different strategies in the work of the nursing team, which should pursue the individualization of care actions and communication approach, bringing the particularities of each family context closer to the care actions that should reach and engage them in this decision-making process[32].

In another context, positive experiences account that families complain less, because they feel more confident with the close presence of the professional, strengthening the bond with the team and fulfilling their needs:

> [...] the team is closer to the family and the patient, this is a strength of the new process [...] (E3).

> [...] I admit that I thought that getting closer to the patients was going to be bad... because here they complain a lot... but it seems that now they even complain less... I don't know if my colleagues agree [...] (NT6).

Family participation, through their involvement in the care process, must be accompanied by multiple communication skills of the nursing staff to bring them closer to the care process to reestablish the patient's health status and ensure safety in the provision of care[33].

Staffing

Reports about the number of professionals appeared in three record units, from both professional categories - nursing technicians and nurses - in negative experiences related to understaffing when the unit has three nursing technicians:

> [...] people need to have more time to do all this... I mean we more people, more staff... the team is understaffed, some people just present a medical certificate, miss work and this hurts those who do come to work [...] (S5).

> [...] when there are three professionals it is critical... they stay very busy during the entire work shift because families demand a lot and now they are even closer to ask for things [...] (S17).

The absenteeism of the nursing staff is a critical situation that is increasingly being discussed by the top management of health organizations. Issues involving the health of these professionals

are recurrent and it is up to the institutions to seek integrated strategies in people management and take proactive actions that can minimize occurrences[34].

The workload can directly influence the safety of the care process, especially in critical activities like medication administration, which demands greater dedication regarding the concentration and individualization of care with the patient. Studies already present strategies for the analysis of these scenarios and the pursuit of alternatives through the restorative ecological approach[35].

CONCLUSIONS

A medication administration process based on the best practices of quality and safety drives reflection on healthcare and on the importance of combining theory and the experience of nursing professionals to foster continuous improvement in the provision of care, with focus on safety and quality.

It is noteworthy that the use of tools and methodologies from other areas of knowledge, such as Bizagi®, process modeling, Management by Processes, mentioned in this article, contributed to the continuous development of strategies to achieve care excellence.

The *Triple Aim*, with its guiding pillars, informs and shares cases that can be multiplied, promoting continuous and essential improvement to ensure the quality and safety of care processes.

By learning from experiences of professionals who have put the process into practice, it was found that improvements and solutions must emerge from the operational team, which is involved with the actions and will make the improvements actually come about in their work context.

It is hoped that the findings of this research may encourage other researchers to pursue continuous improvement in the critical process of medication administration, providing patients and professionals with improved work processes and meeting requirements of quality and safety.

REFERENCES

1. Agency for Healthcare Research and Quality – AHRQ. National healthcare quality and disparities report: chartbook on patient safety. Rockville: Agency for Healthcare Research and Quality; 2016[acesso 10 jun 2018]. Disponível em: https://www.ahrq.gov/sites/default/files/wysiwyg/research/findings/nhqrdr/chartbooks/patientsafety/qdr2015-ptschartbook.pdf
2. Agência Nacional de Vigilância Sanitária – Anvisa. Segurança do paciente e qualidade em serviços de saúde. Brasília, DF: Agência Nacional de Vigilância Sanitária; 2011[acesso 10 jun 2018]. Disponível em: http://portal.anvisa.gov.br/documents/33852/272031/Boletim+Seguran%C3%A7a+do+Paciente+e+Qualidade+em+Servi%C3%A7os+de+Sa%C3%BAde+n%C2%BA+01+Jan-Jul+de+2011/aa36fe6e-f5d5-46ae-9eb6-e93af520fafc
3. Bisognano M, Kenney C. Buscando o *triple aim* na saúde. São Paulo: Atheneu; 2015.
4. Organização Pan-americana de Saúde – OPAS. Organização do trabalho da representação da OPAS/OMS no Brasil 2011-2012. Brasília, DF: Organização Pan-Americana de Saúde; 2011.
5. Organização Nacional de Acreditação – ONA. A ONA e a história da acreditação no Brasil. Brasília, DF: Organização Nacional de Acreditação; 2013[acesso 10 jun 2018]. Disponível em: https://www.ona.org.br/Noticia/216/A-ONA-e-a-historia-da-acreditacao-no-Brasil
6. Gonçalves JEL. As empresas são grandes coleções de processos. Rev Adm Empres. 2000;40(1):6-19. https://doi.org/10.1590/S0034-75902000000100002
7. Vargas MA, Albuquerque GL, Erdman AL, Ramos FRS. Onde (e como) encontramos a qualidade no serviço de enfermagem hospitalar? Rev Bras Enferm. 2007;60(3):339-43. https://doi.org/10.1590/S0034-71672007000300018
8. Miasso AI, Silva AEBC, Cassiani SHB; Grou CR, Oliveira RC, Fakih FT. O processo de preparo e administração de medicamentos: identificação de problemas para propor melhorias e prevenir erros de medicação. Rev Latino-Am Enfermagem. 2006;14(3):534-63. https://doi.org/10.1590/S0104-11692006000300008
9. Silva DO, Grou CR, Miasso AI, Cassiani SHB. Preparo e administração de medicamentos: análise de questionamentos e informações da equipe de enfermagem. Rev Latino-Am Enfermagem. 2007;15(5):1-8. https://doi.org/10.1590/S0104-11692007000500020
10. Agência Nacional de Vigilância Sanitária – Anvisa. O que devemos saber sobre medicamentos. Brasília, DF: Agência Nacional de Vigilância Sanitária; 2010[acesso 10 jun 2018]. Disponível em: http://portal.anvisa.gov.br/resultado-de-busca?p_p_id=101&p_p_lifecycle=0&p_p_state=maximized&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=1&_101_struts_action=%2Fasset_publisher%2Fview_content&_101_assetEntryId=359330&_101_type=document

11. Agência Nacional de Vigilância Sanitária – Anvisa. Protocolo e segurança na prescrição, uso e administração de medicamentos. Brasília, DF: Agência Nacional de Vigilância Sanitária; 2013.

12. Tripp D. Pesquisa-ação: uma introdução metodológica. Educ Pesqu. 2005;31(3):443-66. https://doi.org/10.1590/S1517-97022005000300009.

13. Bizagi Brasil. Guias e tutoriais do Bizagi. São Paulo: Bizagi Brasil; 2012[acesso 10 jun 2018]. Disponível em: https://bizagibrasil.wordpress.com/

14. Association of Business Process Management Professionals Brasil – ABPMPB. Guia para o gerenciamento dos processos e negócios: corpo comum de conhecimento. Brasília, DF: Association of Business Process Management Professionals Brasil; 2013. (ABPMPB PM CBOK V. 3.0)

15. Bardin L. Análise de conteúdo. São Paulo: 70; 2011.

16. Ministério da Saúde (BR). Resolução Nº 466, de 12 de dezembro de 2012. Aprova as diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. Diário Oficial União. 13 jun 2013.

17. Dalla Valentina LVO. Desenvolvimento de um modelo integrado de reengenharia de processos com melhoria contínua para o redesenho de processos [tese]. Florianópolis: Universidade Federal de Santa Catarina; 1998.

18. Galiza DDF, Moura OF, Barros VL, Luz GOA. Preparo e administração de medicamentos: erros cometidos pela equipe de enfermagem. Rev Bras Farm Hosp Serv Saude. 2014;5(2):45-50.

19. Silva LD, Camerini FG. Análise da administração de medicamentos intravenosos em hospital da rede sentinela. Texto Contexto Enferm. 2012;21(3):633-41. https://doi.org/10.1590/S0104-07072012000300019

20. Oliveira ASA. Análise de processo de administração de medicamentos de um hospital público de Aracaju [dissertação]. Sergipe: Universidade Federal de Sergipe; 2016.

21. Santana JC, Souza MA, Soares HC, Avelino KSA. Fatores que influenciam e minimizam os erros na administração de medicamentos pela equipe de enfermagem. Rev Enferm. 2012;15(1):122-37.

22. Ralha CG, Pak AFM. Introdução à modelagem de processos de negócios: teoria e prática. In: Anais do 5º Simpósio Brasileiro de Sistemas de Informação; 20-22 maio 2009; Brasília, DF, Brasil. Brasília, DF: Sociedade Brasileira de Computação; 2009. 331-335.

23. Ceccim RB, Bravin FP, Santos AA. Educação na saúde, saúde coletiva e ciências políticas: uma análise da formação e desenvolvimento para o Sistema Único de Saúde como política pública. Rev Lugar Comum. 2009;28:159-80.

24. Conselho Regional de Enfermagem de São Paulo – Coren-SP. Definições e estratégias de prevenção. São Paulo: Conselho Regional de Enfermagem de São Paulo; 2011[acesso 10 jun 2018]. Disponível em: http://inter.coren-sp.gov.br/sites/default/files/erros_de_medicacao-definicoes_e_estrategias_de_prevencao.pdf

25. Rosa RT, Gehelen MH, Ilha S, Pereira FW, Cassola T, Backes DS. Segurança do paciente na práxis do cuidado de enfermagem: percepção de enfermeiros. Cienc Enferm. 2015;21(3):37-47. https://doi.org/10.4067/S0717-95532015000300004

26. Rocha JP, Silva AEBC, Bezerra ALQ, Sousa MRG, Moreira IA. Eventos adversos identificados nos relatórios de enfermagem em uma clínica pediátrica. Cienc Enferm. 2014;20(2):53-63. https://doi.org/10.4067/S0717-95532014000200006

27. Veloso IR, Telles Filho PCP, Durão AMS. Identificação e análise de erros no preparo de medicamento em uma unidade pediátrica hospitalar. Rev Gaucha Enferm. 2001;32(1):93-9. https://doi.org/10.1590/S1983-14472011000100012

28. Alves KYA; Santos VEP; Dantas CN. A análise do conceito segurança do paciente: a visão evolucionária de Rodgers. Aquichán. 2015;15(4):521-8. https://doi.org/10.5294/aqui.2015.15.4.7

29. Oliveira RC, Cassiani SHB. Characterization of the structure for medication preparation in teaching-hospitals: factors that interfere with the quality of care. Rev Latino-Am Enfermagem. 2007;15(2):224-9. https://doi.org/10.1590/S0104-11692007000200006

30. Simão EAR. Distribuição em ambiente hospitalar: da distribuição clássica aos novos sistemas de distribuição mecânicos [dissertação]. Almada: Instituto Superior de Ciências da Saúde Egas Moniz; 2016.

31. Lorenzetti J, Oro J, Matos E, Gelbcke FL. Organização do trabalho da enfermagem hospitalar: abordagens na literatura. Texto Contexto Enferm. 2014;23(4):1104-12. https://doi.org/10.1590/0104-07072014001510012

32. Sousa EFR, Costa EAO, Dupas G, Wernet M. Acompanhamento de família de crianças com doença crônica: percepção da equipe de saúde da família. Rev Esc Enferm USP. 2013;47(6):1367-72. https://doi.org/10.1590/S0080-623420130000600017

33. Melo EMOP, Ferreira PL, Lima RAG, Mello DF. Envolvimento dos pais nos cuidados de saúde de crianças hospitalizadas. Rev Latino-Am Enfermagem. 2014;22(3):432-9. https://doi.org/10.1590/0104-1169.3308.2434

34. Coelho MA, Bezerra ALQ, Fugulin FMT, Cunha CCB, Marques DO. Absenteísmo da equipe de enfermagem das unidades clínicas de um hospital universitário da região centro-oeste do Brasil. Rev Urug Enferm. 2016;11(1):70-82.

35. Magalhães AMM, Agnol CMD, Marck PB. Carga de trabalho da equipe de enfermagem e segurança do paciente: estudo com método misto na abordagem ecológica restaurativa. Rev Latino-Am Enfermagem. 2013;21(esp):146-54. https://doi.org/10.1590/S0104-11692013000700019

Conflict of Interest

Authors have no potential conflict of interest to declare, related to this study's political or financial peers and institutions.