

Promoting Patient Safety In Pediatrics: Nursing Strategies To Prevent Medication Errors

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ABSTRACT:

Introduction: Patient safety refers to the acceptable minimization of risk, to avoid irrelevant harm related to health care. The National Policy for Comprehensive Child Health Care, established by Ordinance No. 1,130, of August 5, 2015, aims to promote child health care and protect it from possible harm that may result in future harm. The role of nursing in promoting pediatric patient safety implies creating adequate conditions for a healthy development.

Objective: The aim of this study is to identify the main medication errors in pediatric patients and describe the strategies implemented by nurses to reduce these errors.

Methodology: An integrative literature review was carried out, through the search for publications in journals indexed in the LILACS, BDNF and MEDLINE databases, from 2009 to 2018. The final sample consisted of 10 articles. Results: The main factors that directly contributed to the occurrence of medication errors were the lack of support manuals for the preparation of medications, deficiencies in prescription, dispensing, preparation and administration of medications. The main strategies proposed by nursing to reduce medication errors include confirming patient data, such as name, drug name, dose, dilution and time of administration.

Final considerations: It is essential that health professionals reflect on the importance of pediatric patient care and that new studies are carried out emphasizing the need for strategies aimed at the early identification of the causes of errors.

Keywords: Patient Safety, Pediatrics, Nursing, Medication Error.

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I. INTRODUCTION

The World Health Organization (WHO, 2015) estimated that, annually, there is a high number of people who suffer unnecessary harm caused by unsafe health services, leading to injuries and user dissatisfaction.

Patient safety is understood as risk reduction to an acceptable minimum, referring to irrelevant damage associated with health care, that is, reduction of unsafe acts, in care procedures and the use of best practices, improving knowledge to seek to achieve excellent results (ANVISA, 2014).

According to the Ministry of Health, the national patient safety program (PNSP) was instituted, through Ordinance MS/GM No. 529, of April 1, 2013, with the general objective of contributing to the qualification of health care, in all establishments in the national territory, either public or private, depending on the priority given

to patient safety. Considering the need for implementation, to improve and reduce risks aimed at quality and user safety, principles and guidelines were developed, namely (BRASIL, 2013).

In order to outline strategies aimed at the quality of dignified patient care, a basic patient safety protocol was developed with the aim of correctly identifying the patient; improve communication between health professionals; improve safety in prescribing, using and administering medications; ensure the practice of hand hygiene and safe surgery (FIOCRUZ, 2015).

Among the unnecessary damages, adverse events are understood as any incident that may cause harm to the patient, which can be avoided through preventive measures and strategies that may be reorganized and may emphasize the investigation of incidents by monitoring these practices in the health service, which leads to a decrease in user suffering (ANVISA, 2015).

The National Policy for Comprehensive Child Health Care (PNAISC) was instituted by the Ordinance nº 1,130, of August 5, 2015 and promotes child health care and protection from damage that may lead to future injuries, which may cause premature deaths of children and may also affect adult life. The importance of comprehensive care for children is notorious, emphasizing care in early childhood care and those of greater vulnerability. Thus, it is necessary to promote dignified conditions for a healthy, harmonious and peaceful development (BRASIL, 2015).

The doctor's illegible handwriting is one of the most frequent causes of medication errors, linked to the nursing professional's work overload and the lack of communication between them, leading to the belief that through effective communication by the team it can promote conditions that reduce the occurrence of errors (CARVALHO et al., 2013).

Medication error is any harm caused to the patient, related to the inappropriate use of medication, regardless of whether the medication was under the control of the health professional, the patient or the consumer. It may be associated with the professional's practice, communication problems, procedures, prescription, preparation, dispensation, distribution, administration, monitoring and use of the medication (ANACLETO, 2010).

Studies prove the difficulty of nurses, physicians and pediatric residents in performing mathematical calculations. To make an individual dose calculation, the health professional must base it on the child's age, weight and body surface area. Thus, the various phases of the medication process, which range from preparation to administration, involve mathematical operations. These difficulties directly contribute to the occurrence of medication errors in children (BELELA; PEDREIRA; PETERLINI, 2011).

Faced with this problem, it is observed that children are particularly vulnerable to damage, and because they have their particularities such as their age, weight and physical height, it becomes a drug process, but prone to error (VOLPATO et al., 2017).

Still according to Volpato (2017), it is essential to provide strategies that seek the improvement of health professionals, seeking to put into practice the actions established in order to improve care, giving importance and understanding to the process of permanent education that aims at the practice of teaching and learning. Thus, it becomes easier to recognize the possibility of errors in care and, therefore, to outline preventive measures.

In view of this, the question arises: what strategies are used by nursing to reduce errors in pediatric medication? Based on this theme, the hypothesis raised in this study is that qualified training allows nursing professionals to be qualified to reduce medication errors.

Questions about the problem arose due to an observation and discussion in the field of practice of health professionals about the difficulties from preparing solutions to administering medication in pediatrics. This factor often implied insecurity and refusal of the professional to provide care to the child due to the need for more careful handling such as preparation, scheduling and administration.

This research proves to be relevant as it raises the awareness of nurses and health professionals about the importance of pediatric patient care, which can lead to a reduction in adverse events in pediatrics. In addition, it can provide professionals with effective strategies so that they can reduce errors.

Still, it proposes reflection for the academic community about the need for discussion of the theme from the training of nursing professionals, aiming at professional training in prioritizing patient safety in pediatrics.

Given the reflections brought, the present study aims to identify the main medication errors in pediatrics and describe strategies implemented by nursing to reduce these errors.

II. METHODOLOGY

The research method used in this study was an integrative literature review with a qualitative approach.

As mentioned by Mendes, Silveira and Galvão (2008), the integrative review aims to gather and synthesize the results of research related to a given topic, in a systematic and orderly manner.

Qualitative research aims to explore opinions and perceptions, allowing for the systematization of knowledge and in-depth understanding of the object of study, as well as the formulation of new approaches related

to the topic addressed in this research, with patient safety and nursing strategies for reducing of medication errors in pediatrics.

Data collection was carried out in the following databases:

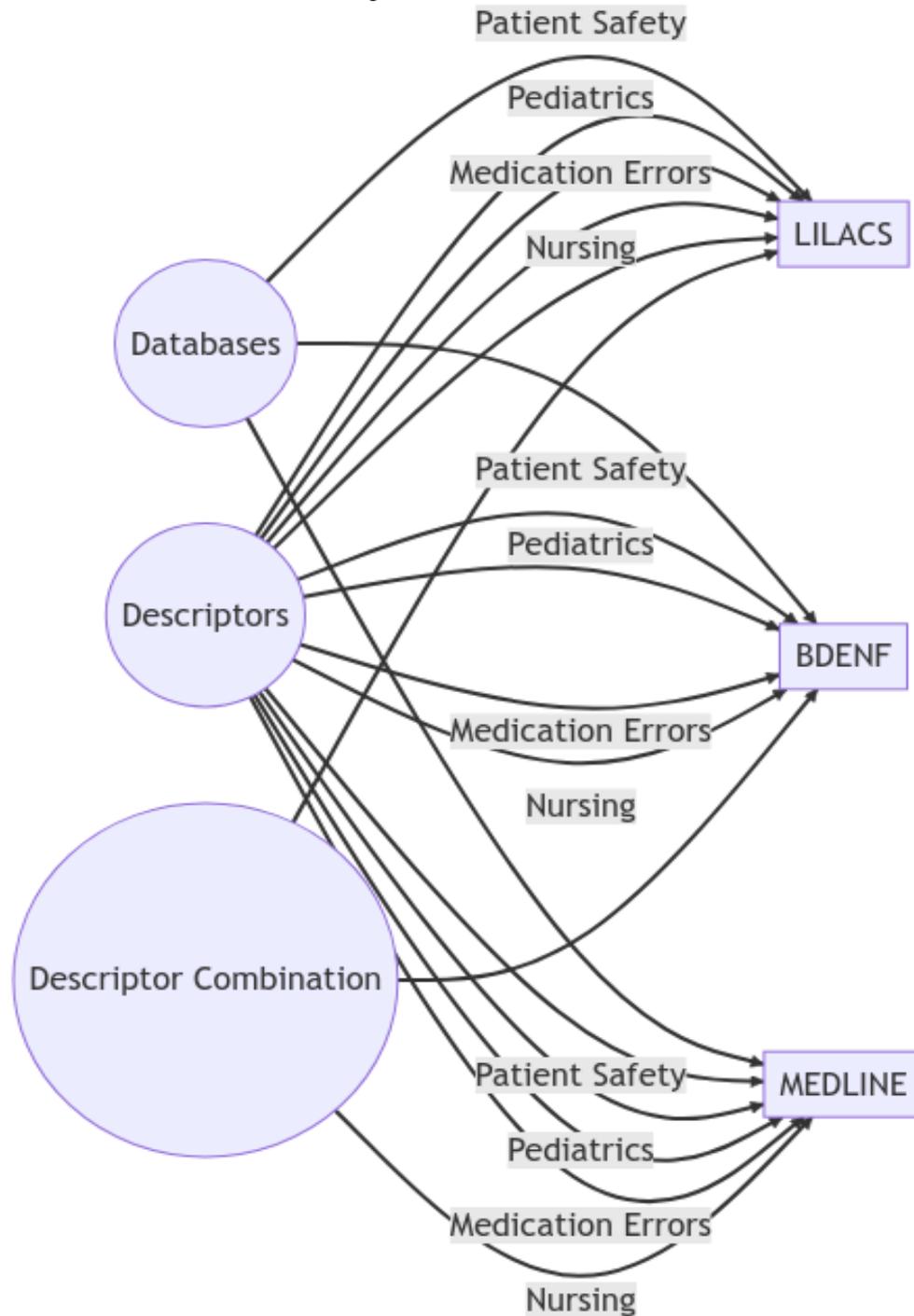


Figure 1: De Oliveira et al. (2018) adapted by the authors.

Original articles were adopted as inclusion criteria, available in full in Portuguese, published from 2009 to 2018. Articles without relevance to the study, repeated in databases, literature reviews, theses and dissertations were excluded.

The analysis was conducted in stages, applying the inclusion and exclusion criteria of the research, performing a superficial reading of the articles and excluding those that were not related to the theme of this study. Then, a thorough reading was performed and a final sample was selected. The analysis was conducted using the

comparative method, which allows evaluating similarities or differences in qualitative studies (LAKATUS; MARCONI, 2010).

During the online search in the Virtual Health Library, 826 articles were initially found. After filtering using the crossing of the descriptors "patient safety" and "pediatrics"; "patient safety", "pediatrics", "medication error" and "nursing"; "patient safety", "pediatrics" and "nursing"; and "medication errors" and "pediatrics", 56 articles were identified.

At the end of the reading stage and after eliminating duplications, 10 articles were considered adequate and relevant to the theme, which constituted the sample of this study.

III. RESULTS

Initially, 826 articles were identified in the databases. Through the established exclusion criteria, 816 articles were previously excluded. As for the year of publication, most articles were concentrated in 2011, 2016 and 2018 (n=2). Of the selected studies, most were conducted by nurses with different academic backgrounds, including undergraduates, graduates, masters and doctors (n=17), in addition to residents (n=5).

The most prevalent type of study among the selected articles was the descriptive study (n=3), followed by cross-sectional study (n=1), retrospective descriptive study (n=1), exploratory descriptive study (n=1), observational study, descriptive and retrospective (n=1), observational study (n=1), descriptive and observational study (n=1) and descriptive and exploratory study (n=1). As for publications, most occurred in nursing journals, as well as in pharmacy journals and pediatric journals.

Among the databases used, LILACS stands out, with the highest number of articles found (n=7), followed by BDENF (n=2) and Medline (n=1). This information is summarized in FRAME 1.

FRAME 1: Number of articles found in the databases, distributed by year of publication and authors' training.

Again	Database	Authors' Formation
2009 (n=1)	LILACS	Nurses: Graduates, Masters and Doctors
2011 (n=2)	LILACS	Nursing Students
2013 (n=1)	-	-
2015 (n=1)	-	-
2016 (n=2)	BDENF	-
2017 (n=1)	-	-
2018 (n=2)	Medline	-

Source:Prepared by the authors, 2019.

The following flowchart illustrates the results obtained based on the methodology used:

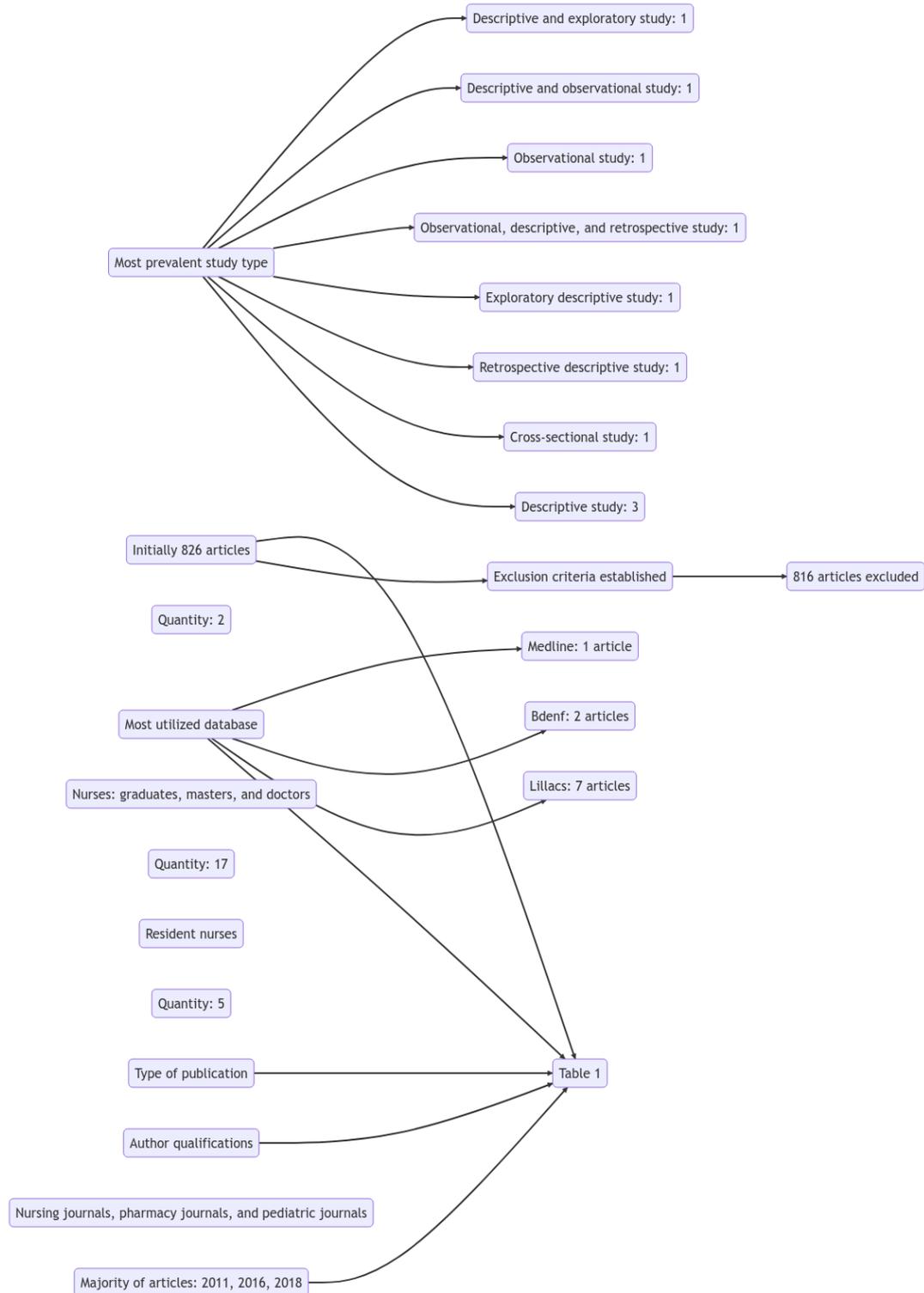


Figure 2: De Oliveira et al. (2018) adapted by the authors.

FRAME 2 presents the results obtained through the methodology used, allowing the comparison of the following aspects: years of publication, authors, article titles, databases found, proposed objectives and main

findings. This systematic data analysis contributes to an in-depth understanding of the subject under study and enables the identification of relevant patterns and trends.

FRAME 2. Results obtained comparing aspects used in the research.

Year	Database	Authors	Article Titles	Goals	Main Findings
2018	BDEF	ROCHA, et al.	Safe medication administration in neonatology and pediatrics: nursing care.	Knowing the nursing care related to the safe administration of medications in neonatology and pediatrics.	The study emphasizes the importance of identifying and checking before administering medication, requiring nurses' skills and competences.
2018	MEDLINE	SOUZA, et al.	Patient safety in the administration of intramuscular medication in pediatrics: evaluation of nursing practice.	Evaluate the nursing practice in the administration of intramuscular drugs in pediatrics.	Weaknesses in intramuscular administration in pediatric patients were identified, indicating the need for improvements in the adopted procedures.
2017	LILACS	KOLANKIEWICZ, et al.	Patient safety climate among nursing workers: contributing factors.	Measuring the safety climate and contributing factors from the perspective of nursing workers.	Nurses had a lower level of stress and greater job satisfaction compared to nursing assistants and technicians.
2015	LILACS	SOUZA, et al.	Child identification in pediatrics: perceptions of nursing professionals.	To know the perceptions of nursing professionals about the identification of pediatric patients.	Correct patient identification is considered a right and a necessary element for patient and nursing professional safety.
2016	LILACS	ALVES; GUIARDELLO.	Nursing work environment, patient safety and quality of care in a pediatric hospital.	To describe the characteristics of the nursing environment in pediatric units and analyze care indicators.	Nurses, technicians and nursing assistants reported positive perceptions regarding the work environment, however, a low involvement in patient safety was identified.
2016	LILACS	MOTA, et al.	Preparation of drugs administered intramuscularly in pediatrics: performance of the nursing team.	Evaluate the performance of the nursing team in the preparation of drugs administered intramuscularly.	A good performance was observed in the preparation and dilution of drugs administered intramuscularly, with special attention to the choice of the appropriate syringe.

Source:Prepared by the authors, 2019.

IV. DISCUSSIONS

Adverse drug-related events can cause several harms to the patient, and this problem is currently considered a public health problem, with the potential to generate social and economic repercussions in the future (COSTA et al., 2018).

According to Fiocruz (2014), medication errors are serious public health problems, affecting both patients and their families as well as health systems and professionals involved. It is essential to evaluate the occurrence of these errors on a daily basis, in the practice of health professionals, identifying the weaknesses that contribute to their occurrence and seeking to reduce them.

According to Costa (2018), the high rate of prescription errors has caused harmful consequences for patients. The analysis of medical records in a pediatric clinic, whose target audience are children and adolescents from zero to 18 years old, revealed that 12.8% of the prescriptions did not contain the age of the patients, age being a crucial factor in pediatrics to assess indications and contraindications.

The discussion resulting from this study highlights that the main elements that contribute to the occurrence of these errors are related to the illegibility of the prescription, making it difficult to understand, the use of non-existent abbreviations and incomplete information.

According to the Ministry of Health (2013), safety in the prescription, use and administration of medicines is extremely important. The prescription must be legible, and the patient identification data must be complete and without abbreviations. The use of abbreviations in patient identification data or the incompleteness of such data should be eliminated from health care practices due to the high risk of medication errors.

Rocha et al. (2018) propose that the safe administration of medications should consider the risk factors associated with the patient, making their correct identification paramount.

For the proper administration of medications, it is necessary that the entire nursing team has technical-scientific knowledge, and the nurse, when supervising the technical team, must promote open communication and act as a health educator whenever doubts arise regarding the administration of medication. medicines (ROCHA et al., 2018).

Rocha et al. (2018) also propose confirmation of data as a strategy to reduce medication errors in pediatrics, including the child's name, bed, name of medication, dose, dilution and time of administration. They also emphasize the need for medication verification, recording of each medication administered, labeling the syringe with the name of the medication, separating each patient's medications into trays, verifying the validity of medications, accurately calculating the doses to be administered, correct dilution and slow administration according to the infusion rate indicated for each type of solution.

COFEN Resolution No. 564 of 2017, which establishes the new code of ethics for the nursing team, emphasizes in articles 78 and 80 of chapter III that the administration of medication is prohibited without knowledge of information regarding indications, actions, routes of administration and potential risks of the drug, as well as the execution of prescriptions and procedures that compromise patient safety (COFEN, 2017).

This new code of ethics aims to update Law No. 7,498 of June 25, 1986, which deals with the legislation on the professional practice of nursing, and its subsequent regulation by Decree No. 94,406 of June 8, 1987 (COFEN, 1986 ; COFEN, 1987). Resolution n.º 564 (2017) brings new reflections in the professional scope, considering the changes that have occurred over the years and understanding that nursing is directly linked to the care and commitment to the health and well-being of patients and their families , acting in the promotion, prevention and recovery of health with autonomy, according to ethical and legal precepts.

In the study carried out by Souza et al. (2015), emphasizes the importance of identifying the pediatric patient and the need for prioritization in health environments, considering the need for specific care for the management of the child, considering their physical and morphological characteristics in each phase of child development. It is also stated that most professionals recognize that patient identification is essential to ensure the quality of care and patient safety.

It is extremely important to encourage health professionals to seek strategies that promote safety and mastery in the handling of medications, in addition to maintaining a plan of continuous educational activities that address the main difficulties encountered in the work environment.

Faced with the difficulty in managing medication, international goals were established in 2013, with the approval and implementation of six safety protocols by the Ministry of Health, with correct patient identification being a fundamental step from patient admission to discharge (BRASIL, 2013).

A study carried out by Alves et al. (2016), who analyzed the relationship between the work environment and the quality of care in a pediatric hospital with a certification of excellence, demonstrated that the perception and satisfaction in the work environment are directly related to the reduction in the incidence of phlebitis, the length of hospitalization and improving the quality of care provided to children.

Kolankenwicz et al. (2017), using the same method employed by Alves (2016), compared the perception of satisfaction with the work environment among nurses and nursing technicians/assistants. The results showed that nurses were up to a third more satisfied than other nursing categories, and this disparity occurred especially in the assessment of work overload conditions. In hospital practice, nursing technicians are the professionals most involved in the process of administering medication to patients.

Therefore, it is possible to infer that the improvement of working conditions, as well as an adequate dimensioning of the team, can be an effective strategy to reduce medication errors. In addition, the importance of the participation of hospital management and nurses as team leaders to increase pediatric patient safety is highlighted.

Yamamoto (2011), in his study, points out that the most common medication errors are dose omission, inadequate dose and incorrect infusion rate. There are also errors in dose formulation, administration technique, route of administration, time, division, monitoring and even patient identification. The author explains that these errors are related to the poor performance of professionals, influenced by human factors in activities involved in drug therapy.

Errors found in prescriptions can be classified as writing errors, with the most frequent problems being the omission of the dose and errors in the pharmaceutical form and route of administration (MOTA et al., 2016). Faced with the magnitude of the problem of medication errors worldwide, the World Health Organization (2018) launched the Global Patient Safety Challenge to halve medication errors and, consequently, preventable harm (WHO, 2018).

Despite having a global importance, it is essential to consider the particularities and specific challenges of each work location or sector, according to its routine and risk factors that can lead to errors, in order to work on local difficulties and reduce related incidents to medication. Knowing the failures and problems is essential to ensure quality assistance.

Inadequate management of medication preparation, related to an inadequate environment with the presence of noise, absence of documents such as manuals of standard procedures and failures in hand hygiene techniques, ampoules and bottles, results in errors (VELOSO; FILHO; DURÃO, 2011). Faced with all these difficulties encountered in this study, it is necessary to reorganize and implement a support manual for the correct practice of preparing and administering medication, including educational actions and standard procedures on the correct management of medication, offering care, safety and quality for patients, families and health professionals.

Failure in hand hygiene is one of the main causes of infections related to health care, and, in view of this, the National Health Surveillance Agency (ANVISA) launched a technical note in 2018 to implement improvements in health units. This note addresses the selection of hand hygiene products, ranging from simple hygiene to antiseptics and surgical hand hygiene (ANVISA, 2018).

Souza (2018) analyzed the performance of professionals before, during and after the administration of intramuscular drugs in children and found an unsatisfactory performance in communicating with the child and those responsible for the procedures. Every patient must be guided and informed about the prescribed medications, and, when it comes to children, clear communication can reassure both the child and those responsible for them.

In this discussion about the importance of developing strategies and actions for managers, professionals and health users, the creation of the Implementation Committee of the National Patient Safety Program (CIPNSP) arises, through Ordinance No. 1978 of September 2014, to promote improvement and care for patient safety. Article 2 of this ordinance emphasizes the importance of communication in the health services environment as a strategy that allows the reduction of the occurrence of adverse events in health care (BRASIL, 2014).

In the study by Mota et al. (2016), an unsatisfactory performance was observed in relation to the complete use of personal protective equipment indicated for the intramuscular medication administration procedure, as well as in verifying the validity of the medications. This study corroborates the conclusions of Veloso (2011), as failures were also identified in the disinfection of the ampoule or vial with 70% alcohol. Disinfection with 70% alcohol is a simple, low-cost, and easy-to-apply strategy that should be part of routine medication preparation (MOTA, 2016; VELOSO; FILHO; DURÃO, 2011).

The proper use of Personal Protective Equipment (PPE) is extremely important for patient and professional safety during the process of care and preparation of medications. The use of gloves, masks and caps when administering intramuscular medications reduces the risk of contamination for both the professional and the patient, protecting them from fluids and microorganisms. However, in certain conditions, such as the application of intramuscular, subcutaneous and intradermal drugs, the use of gloves is not recommended, as if the patient's skin is intact, without lesions or secretions, the risk of contamination is low (MOTA et al., 2016).

In 2013, Tonello et al. conducted a study on the evaluation of medication use in pediatrics. In this study, medical records were analyzed to assess the number of drugs prescribed, the mode of dilution, the adequacy of the prescribed dose and the route of administration. Most of the drugs prescribed were analgesics and antibacterials, and the most common route of administration was intravenous. Regarding dosage, errors were found in the medications of newborn and preschool-aged patients, especially in medications such as penicillin, gentamicin, paracetamol and carbamazepine, which was related to several professionals involved in the medication administration process (TONELLO et al., 2013).

This highlights the need to institute strategies aimed at multidisciplinary actions in the routine of services, aiming to work together in pursuit of a common goal. In practice, as a nursing professional, a limited interaction of the pharmaceutical professional in the health education process related to the medication administration steps is observed. Therefore, the essential participation not only of the physician and the nursing team, but also of the pharmacists is highlighted, in order to reduce failures and errors, providing information and clarifying related doubts.

In this sense, the Ministry of Health launched in 2017 a document that presents the analysis and recommendations of managers, specialists and organized civil society on policies and proposals for the development and qualification of pharmaceutical assistance. This document addresses a historical retrospective of the twenty years of pharmaceutical assistance in the Unified Health System (SUS), identifying the main problems faced in this period and proposing some solutions (BRASIL, 2018).

Among the main problems highlighted by the Ministry of Health (2018) are underfunding, the lack of inclusion of Pharmaceutical Assistance in planning and management instruments, and the difficulty of inserting Pharmaceutical Assistance management in Health Care. These issues highlight the importance of management in issues related to medications discussed in the study by Souza (2016).

In the same document, other critical areas were identified, such as the structure of medication programming and acquisition, education and human resources, and medication dispensing and care. The main proposals focus on the mobilization of managers, reformulation of values for financing pharmaceutical assistance within the scope of the SUS, and adoption of suggested minimum standards for teams and attributions of the main professionals of Pharmaceutical Assistance, such as pharmacists and pharmacy assistants/technicians. Thus, the importance of multidisciplinary participation in reducing medication errors in patients, including pediatric patients, in both the public and private sectors is highlighted (BRASIL, 2018).

Costa, Rey and Coelho (2009) stated that, in Brazil, there was no specific regulation for the registration and use of medicines in children. However, in 2018, the Ministry of Health released a manual with recommendations and strategies to expand access and promote the rational use of medicines in children (BRASIL, 2018). This manual was developed to contribute to the advancement of drug development, enabling studies on formulations suitable for the pediatric public, aiming at the development of better drugs for this age group. In addition, the manual addresses aspects related to manipulation and preparation of pediatric doses, establishing specific regulations for this purpose.

V. FINAL CONSIDERATIONS

In this study, the main elements that directly contribute to the occurrence of medication errors emerge, highlighting the lack of a support manual for the preparation of medications and deficiencies in prescription, dispensing, preparation and administration. As a result, the most commonly identified errors were dose omission, inadequate dose, and errors in concentration, dose formulation, technique, route, time, division, monitoring, and patient identification.

In view of this, strategies were proposed to reduce medication errors in pediatrics, including confirmation of data through the child's name, bed, name of the medication, dose, dilution and time of administration. Also highlighted is the need to check the medications, record each administration, label the syringe, separate the medications, check their validity, perform accurate calculations of the doses to be administered, perform correct dilution and administer slowly according to the infusion rate indicated for each type. of solution.

Therefore, the technical-scientific knowledge of the entire nursing team, including the nurse, is fundamental. In addition, the team should promote open communication and act as a health education agent, clarifying doubts regarding medication administration. It also highlights the importance of full support from managers in the face of these difficulties, adapting the teaching methodology to the reality of the institution and maintaining an adequate work environment.

A gap identified in this study was the scarcity of publications that analyzed the causes of medication errors in pediatrics and proposed nursing strategies for their reduction. Thus, it is necessary for health professionals to reflect on the importance of caring for pediatric patients, and for new studies to be carried out, emphasizing the need for strategies that identify the causes of errors early, in order to adopt preventive measures and guarantee a quality care. quality to the pediatric patient.

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