








# Meanings and actions inferred by nurses for minimizing medication errors in pediatrics\*

Significados e ações inferidos por enfermeiras para a minimização do erro de medicamentos em pediatria

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## ABSTRACT

**Objective:** to understand the meanings and actions inferred by nurses to minimize the error in the administration of medications in pediatrics. **Methods:** a qualitative study anchored in Symbolic Interactionism. Data were collected through semi-structured interviews with 11 nurses, who attributed the meanings and their actions to reduce medication errors in Pediatrics. The content analysis was composed of pre-analysis, exploration, treatment and interpretation of data. **Results:** three categories emerged: Individual actions (planning, attention, communication and application of the checklist in the use of the “right ones”); Multi-professional and organizational interactions (teamwork, automated system, staff dimensioning, double-checking in checking medications, professional articulation, organizational actions, institutional policies and communication) and Continuing education strategies (training and capacity building). **Conclusion:** technical aspects, work dynamics, need for updating, attitudes related to individual actions, multi-professional interactions, organizational and continuing education were meanings and actions inferred by nurses for the minimization of the error in medication administration in Pediatrics. **Contributions to practice:** it is necessary that the topic of medication administration be a continuous point in the permanent education programs in the health services in order to guarantee the minimization of errors and thus promote greater safety for users.

**Descriptors:** Nurses; Medication Errors; Pediatrics; Qualitative Research.

## RESUMO

**Objetivo:** compreender os significados e as ações inferidos por enfermeiras para a minimização do erro na administração de medicamentos em pediatria. **Métodos:** estudo de natureza qualitativa ancorado no Intencionismo Simbólico. Realizou-se a coleta de dados mediante entrevista semiestruturada com 11 enfermeiras, que atribuíram os significados e suas ações para a redução do erro de medicamentos em Pediatria. A análise do conteúdo foi composta por pré-análise, exploração, tratamento e interpretação dos dados. **Resultados:** emergiram três categorias: Ações individuais (planejamento, atenção, comunicação e aplicação do *checklist* na utilização dos “certos”); Interações multiprofissionais e organizacionais (trabalho em equipe, sistema automatizado, dimensionamento de pessoal, dupla verificação na conferência das medicações, articulação profissional, ações organizacionais, políticas institucionais e comunicação) e Estratégias na educação continuada (treinamentos e capacitações). **Conclusão:** aspectos técnicos, dinâmica de trabalho, necessidade de atualização, atitudes relacionadas às ações individuais, interações multiprofissionais, organizacionais e educação continuada foram significados e ações inferidos por enfermeiras para a minimização do erro na administração de medicamentos em Pediatria. **Contribuições para a prática:** faz-se necessário que o tema administração de medicamentos seja ponto contínuo dos programas de educação permanente nos serviços de saúde com vistas a garantir a minimização dos erros e assim promover maior segurança aos usuários.

**Descritores:** Enfermeiras e Enfermeiros; Erros de Medicação; Pediatria; Pesquisa Qualitativa.

## Introduction

Patient safety represents a priority for public health and has international goals that enable improvements in the quality of health care. Among the international patient safety goals are correct patient identification, improved staff communication, safe use of alarms, prevention of healthcare-related infections, prevention of surgical errors, and safe use of medications<sup>(1)</sup>.

Given the need to develop health practices in line with patient safety, medication administration is a pillar for quality care. Drug therapy is a complex and multidisciplinary process that demands attention and commitment from all professionals involved in the provision of care, with the purpose of ensuring quality, effective, and safe care to patients. In this context, the step of drug administration is a responsibility assigned to the Nursing team and is configured as the last opportunity to intervene and prevent the occurrence of errors, which may have started in the previous steps of this process<sup>(2)</sup>.

When considering this scenario, the nurse plays a fundamental role, since she guides and supervises the Nursing team and also acts in the preparation, administration and evaluation of the patient after the medication process. Thus, nurses may have different experiences of the medication administration process, which makes it necessary to understand the meanings attributed by professionals to reduce the error in medication administration<sup>(3)</sup>.

Children are vulnerable to medication errors due to the specificities of age groups, dependence on self-care, different stages of development, unavailability of specific pharmaceutical forms for this population, and the need to perform individualized dose calculations based on variables such as weight and height. In addition, younger children present higher mortality risks when faced with a medication error, because the risk of injury is greater<sup>(4)</sup> and the error can result in psychological damage, lack of confidence

in the healthcare team, and increased hospitalization costs.

There is greater vulnerability of younger children because most errors occur mainly in children under five years of age and 25% of the cases require intensive care. In addition, these cases show an annual incidence of medication errors equivalent to one for every 3,797 hospitalizations<sup>(5)</sup>. Thus, interventions to minimize errors are essential, as well as the promotion of safety actions and the assurance of safe practices to patients. Among these actions are the individual ones, performed by health professionals, the institutions' multi-professional and organizational actions, and educational strategies. A study revealed the importance of identifying the error, recognizing the factors involved in the error, establishing protocols, recognizing the work processes of the nursing team, and strengthening continuing education to minimize errors<sup>(6)</sup>. However, there is a lack of studies that seek the perceptions of professionals involved in the planning and administration of medicines to recognize their values and meanings attributed to the actions in this theme.

Considering the relevance of this theme for pediatric patient safety, this study had as its guiding question: What is the meaning inferred by nurses to minimize the error in medication administration in pediatrics? This study is justified by the potentiality of the actions developed by these professionals and to provide elements to support safer practices, defining the objective to understand the meanings and actions inferred by nurses to minimize the error in the administration of medications in pediatrics.

## Methods

Qualitative study, supported by the referential of Symbolic Interactionism, which allows the understanding of meanings through the interpretation of individual actions, social interactions and changes in the processes experienced. Meaning is one of the most

important elements in the understanding of human behavior, interactions, and processes<sup>(7)</sup>. It was developed according to the criteria recommended for qualitative research, considering the quality, language, and scientific merit.

The study was carried out in three pediatric medical-surgical units, totaling 102 beds, with twelve nurses working in the morning, afternoon and evening shifts. This institution is a reference in pediatric surgery in the state of Bahia. The team of pediatric nurses is composed of 12 professionals and all of them were invited to participate in the study. Inclusion criteria were: nurses who provided direct care to hospitalized children or adolescents. Exclusion criteria were: professionals who had been working for less than six months. One of the eligible nurses did not accept to participate, citing lack of time. The approach with the participants occurred through visits of the main researcher to the study locus to understand the steps involved in the medication administration process.

Data was collected between July and November 2020 by the main researcher, who did field reconnaissance before the beginning of the collection to identify the possible participants of the study and who did not have professional ties with the pediatric units and the nurses interviewed. The data collection script was composed of two parts - characterization of the participants (age, gender, employment relationship, professional experience and qualifications) and guiding questions of interview (Tell us about the meaning of medication administration errors in Pediatrics for you. Share your experiences about actions to minimize the error). The data collection script was previously applied in pilot interviews and these did not compose the sample. The date and place of collection were agreed with each participant, according to their availability, so that their privacy was guaranteed. The interviews lasted about 30 minutes, were recorded, and at the end the researcher validated the information shared with the participants to make sure about the impressions and understandings of the inter-

views. Subsequently, the audios were transcribed in full to a text editor with corrections that did not alter the reports.

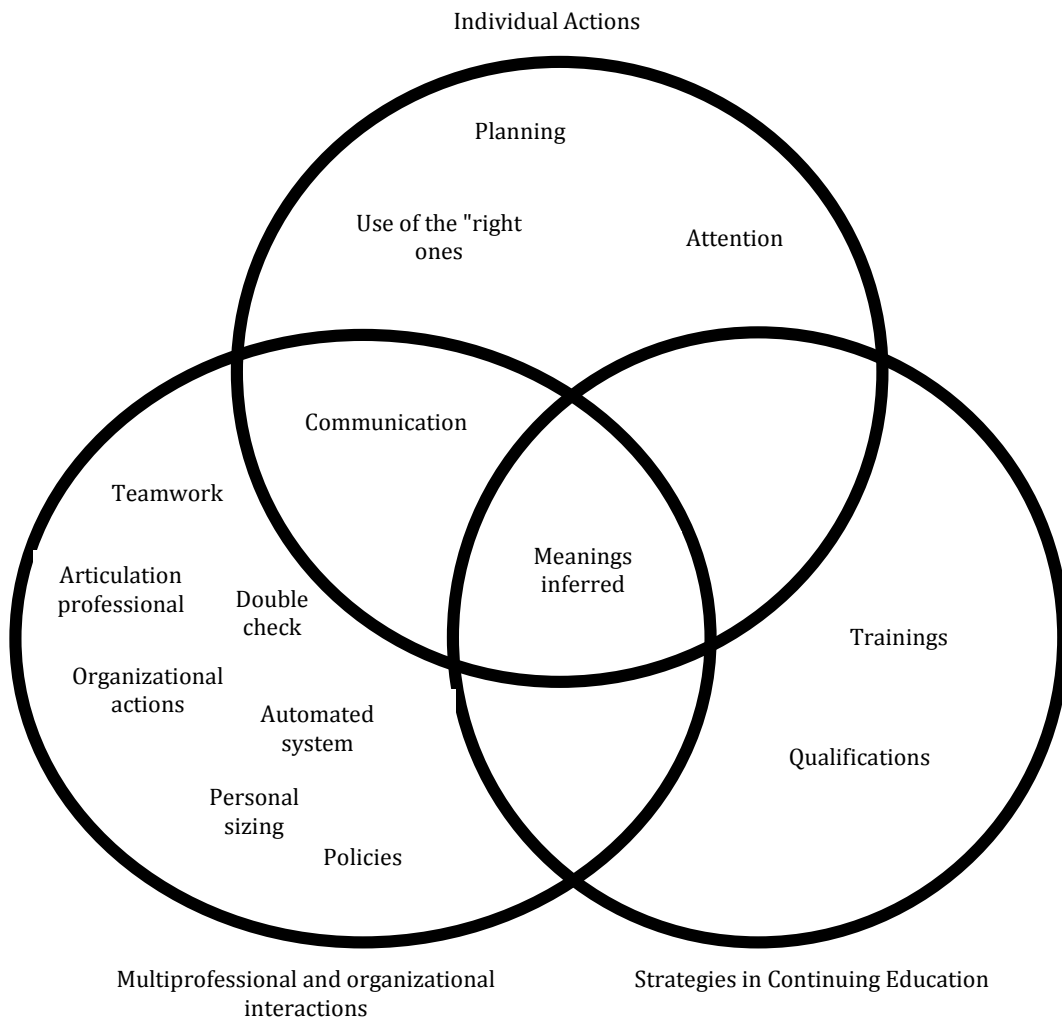
The interviews were coded with the term Nurse, followed by a number, according to the order in which the interview was conducted. The content analysis was composed of pre-analysis, exploration, treatment and interpretation of the data<sup>(8)</sup>. These phases were discussed between pairs of researchers to identify: the organization of the analysis; coding; categorization; treatment of results; inference and the interpretation of results from the perspective of Symbolic Interactionism.

The collection was finalized after the interviews were carried out with all the participants. From this analysis, it was possible to emerge three thematic categories: Individual actions in error minimization; Multi-professional and organizational interactions for error minimization and Strategies in continuing education. This study complied with the ethical aspects approved by the Research Ethics Committee of the School of Nursing of the Federal University of Bahia under Opinion number 3,789,771/2019.

## Results

The 11 participants in the study were female, with ages ranging from 26 to 41 years. Nine participants declared themselves brown, and two declared themselves black. Undergraduate nursing education ranged from one to 12 years. Seven participants had five years or less of experience in the pediatric area and, as for postgraduate studies, five were specialists in pediatrics, three had specialization in other areas and three had no academic specialization.

The data from this study reveal that nurses attribute meanings and actions to minimize the error in medication administration in Pediatrics permeated by the individual, collective and continuing education perspective, as shown in Figure 1.



**Figure 1** – Representation of meanings inferred by nurses for minimizing medication error in Pediatrics. Salvador, BA, Brazil, 2020

**Individual actions**

The study participants understand the error considering their experiences and reveal that it is possible to institute actions that minimize the occurrence of errors during medication administration. Such actions take on the symbolic meaning of the individual actions presented in the participants’ perspective: *Print name tags and fill in the dose, time and medication manually performed by professionals after checking the medical prescription ... check name and medication every time with the child’s companion; another action is to avoid distributing patients with the same names on the daily activity schedule* (Nurse 07). *Effective communication*

*between professionals and companions...* (Nurse 10). *Carry out the separation of medications according to the prescription, administer and check the medication calmly* (Nurse 04). *Attention and concentration in this medication process, I mean, professional of medication administration, follow patient safety protocols* (Nurse 06).

Actions related to checking medication administration with the application of the checklist of the “right” rule for safe medication were highlighted in the speeches of the interviewed participants: *Need to be aware of the patient’s name, route of administration, patient’s bed, medication name, dose* (Nurse 05). *Apply the rules/standards for checking medications, the right nine, attention in the preparation and calculation of medications, among others* (Nurse.10). *Whenever*

any medication is taken, pay attention to check the correct dose, the correct route and the correct patient (Nurse 11).

### **Multiprofessional and organizational interactions**

Examples of collective actions indicated as strategies for reducing the occurrence of error: *The double-checking by professionals is important to minimize the error* (Nurse 01). *Avoid handwritten prescription where we find (calligraphic) letters that induce doubt on the name of the medicine and the prescribed dose* (Nurse 06). *Having adequate dimensioning that reduces the overload for the professionals brings organization to the service* (Nurse 09).

It is also identified, from the speeches of these nurses, that there are organizational actions that can solve possible obstacles to the pharmacological presentation of medicines, reducing the occurrence of errors: *Sign, in a way that is clear, similar medication packages* (Nurse 03). *Reduce interruptions during medication preparation; train the team; create standardization manuals for dilution of these medications* (Nurse 06).

Another meaning inferred by the participants to the occurrence of error is the lack of adequate professional dimensioning, which favors the occurrence of errors during the provision of care, as identified in some speeches: *Lack of proper dimensioning, overloading the technicians and nurses who assist many patients, beyond what is indicated by the competent bodies, is inhumane and illegal* (Nurse 09). *Fair dimensioning... avoid distributing patients with the same names...* (Nurse 07).

### **Strategies in continuing education**

For this thematic category, the participants reveal the need for training and capacity building as a possible strategy to minimize the occurrence of error: *The behaviors to minimize errors in medication administration should be continuous training of the Nursing team* (Nurse 02). *What could minimize the error would be through courses (updates and training)* (Nurse 08). *The error is routine, but can be minimized from the team's training* (Nurse 05).

Some speeches refer to the importance of specific themes to be worked on in continuing education:

*Continuing education should work on medication errors to minimize fear and taboo about medication errors* (Nurse 03). *It should provide guidance to the person responsible for the error* (Nurse 09). *Regarding the topic, updating professionals routinely* (Nurse.08). *Conduct training to emphasize the importance of patient safety protocols* (Nurse 01).

### **Discussion**

The nurses in this study shared behaviors, actions and reactions from their individual and group daily lives, bringing representations and experiences that denote meanings based on their professional practices to reduce medication errors. Among them, planning actions, communication, attention, and the use of the “right” ones in the process of medication preparation and administration are highlighted. It was pointed out in a review article that effective communication was effective in reducing medication errors<sup>(6)</sup>. Thus, the participants act according to their senses and with the understanding of actions that they evaluate as safe and effective. When considering these actions as safe administration protectors, it is possible to observe the need to include new individual actions by nurses that enable safe care, since these were not inferred by the participants of this study, such as the reduction of distractions, stress level, and multidisciplinary articulation in the medication process.

Higher-level professionals and those with less time in training are more prone to measures to reduce medication errors. Error reporting is an individual action that was not inferred by nurses, and studies have shown that this attitude enables the identification of factors that involved the error that occurred, making it possible to plan future strategies to reduce errors<sup>(6,9-10)</sup>. The speeches revealed that actions such as teamwork and double-checking with another professional when checking medications are strategies indicated for reducing the occurrence of errors. From this perspective, it is understood that human interaction is mediated by the interpretation and determination of meanings to the actions of others.

Teamwork enables the development of knowledge, skills, leadership actions, monitoring actions, and the evaluation of actions and mutual support<sup>(11)</sup>. Double-checking to reduce errors or harm to children, despite being implemented and widespread in hospitals, has no proven effectiveness<sup>(12)</sup>. Thus, it is suggested that studies be conducted to evaluate the impact, in Brazil, of the use of double-checking for the prevention of medication errors. These attitudes allow reflection and reaction, revealing that individual behavior can be affected by the behavior of others, a necessary situation for the understanding of the symbolic meaning for the minimization of error.

Handwritten prescriptions can make understanding difficult and contribute to the occurrence of medication errors. Currently, automated systems imply high cost for the institution due to the need for training, purchase of systems, and technical support, which impact their implementation in hospitals with fewer financial resources, such as philanthropic hospitals<sup>(13)</sup>. But once implemented, it can create a safer process and promote efficiency of care, reducing costs in the long run<sup>(14)</sup>.

The inadequate dimensioning of the nurses and nursing technicians was pointed out by the participants as a factor of overload for the health professionals who provide care to patients. Sizing is a management resource in the hospital to ensure continuous and safe nursing care to inpatients according to the demands of the service<sup>(15)</sup>.

The minimum parameters through the levels of care, the degree of assistance and the technical security index to presume and determine the number of professionals in the different Nursing categories<sup>(15)</sup> and the under sizing of nursing professionals are associated with high workloads<sup>(16)</sup>. When interaction occurs and the division of labor is guaranteed in an equitable way, the experiences of the exchanges and the actions taken by the other are shared, and these symbols are used to share perspectives and actions<sup>(7)</sup>. With the dynamics and work overload, it is observed that the professionals use strategies that facilitate

their work process in the assistance, but weaken aspects of safety in the administration of medications.

Correct patient identification is a key strategy for reducing the risk of harm. The World Health Organization (WHO) recommends actions to ensure the proper identification of patients through the use of at least two identifiers (name and date of birth) associated with the use of technologies<sup>(17)</sup>. In this research, factors were identified in the daily scale distribution process that interferes with medication administration errors, such as the identification of homonymous names. Thus, it is necessary to implement strategies to reduce this risk, such as automated systems with codes for medication administration, implementation and monitoring of effective patient safety protocols, photos of patients at registration, identification of patient demographics and biometric identification, double-checking of distribution, and adequate sizing of the nursing staff<sup>(18)</sup>.

In the third category, there is a description of the implementation of educational processes through continuing education on the preparation, administration of medications and patient safety, which were inferred to reduce errors<sup>(7)</sup>. Through their lived experiences, the participants elaborated strategies for their behaviors. By perceiving the interaction of acts, they elaborated responses, new meanings and senses that permeated intentions and future behaviors such as the search for the updating of knowledge.

Continuing education has as its main objective the technical-scientific updating, enabling the sequential and accumulative acquisition of knowledge, individually, with traditional methodology. However, it should be structured by means of permanent education in a continuous and dynamic way from the multi-professional critical analysis of health problems and their solutions through theoretical and social practices, based on constructivist theories<sup>(19)</sup>.

Continuing education is a strategy for the insertion of the topic related to patient safety in the professional routine, which must be incorporated into the institutions systemically, enabling the development of



practices that minimize medication administration errors<sup>(19)</sup>. The distance learning trainings were effective for professional training when compared to other traditional methodologies (slide presentations, posters)<sup>(20)</sup>. Given this context, institutions must identify the effective strategies feasible for the implementation of continuing education actions on the subject, seeking to recognize the meanings interpreted by nurses regarding the actions to minimize the error in medication administration.

### Study limitations

The study presents, as a limitation, the consideration of meanings by nurses of pediatric units of a general hospital. It is necessary to investigate aspects related to medication errors in pediatric hospitals whose actions are specifically directed to the pediatric clientele. However, it is considered that the results of this manuscript contribute to the planning of actions in general health services that serve children. From the methodological point of view, we highlight the subjectivity of the experiences lived by the participants, which may be different from those of other professionals in other health services.

### Contributions to practice

Understanding the meanings and actions inferred by nurses in the medication administration error in pediatrics is to be able to execute assertive strategies for the promotion of safe care, giving voice to professionals who experience, on a daily basis, medication-related failures. It is necessary to implement institutional strategies that strengthen professional training, ensure adequate distribution of work, considering the specificities of pediatric clinics, and evaluate the occurrences of errors, seeking the understanding of the fact that occurred and not the blaming of professionals through the notifications of adverse events and safety culture. Thus, this study contributes effectively to the discussion of good practices in pediatric care.

### Conclusion

The technical aspects, the work dynamics, the need for updating, the attitudes related to individual actions, the multi-professional, organizational and continuing education interactions were the meanings and actions inferred by nurses for minimizing the error in medication administration in Pediatrics.

### Authors' contribution

Conception and design or data analysis and interpretation: Moraes JAS, Camargo CL, Whitaker MCO.

Writing of the article or relevant critical review of the intellectual content: Moraes JAS, Camargo CL, Silva MMFQ, Souza ASC, Oliveira VRSS, Oliveira MMC, Whitaker MCO.

Final approval of the version to be published: Moraes JAS, Camargo CL, Silva MMFQ, Souza ASC, Oliveira VRSS, Oliveira MMC, Whitaker MCO.

Agreement to be responsible for all aspects of the manuscript related to the accuracy or completeness of any part of the work being properly investigated and resolved: Moraes JAS, Camargo CL, Silva MMFQ, Souza ASC, Oliveira VRSS, Oliveira MMC, Whitaker MCO.

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